THE TANJORE MAHARAJA SERFOGI'S SARASWATI MAHAL.
2778

NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON.

VOL. VI.

HISTORY OF QUADRUPEDS.

580

NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON,

ILLUSTRATED WITH ABOVE SIX HUNDRED COPPER PLATES,

2

2778

THE

HISTORY OF MAN AND QUADRUPEDS

TRANSLATED, WITH NOTES AND OBSERVATIONS,

BY WILLIAM SMELLIE,

MEMBER OF THE ANTIQUARIAN AND ROYAL SOCIETIES OF EDINBURGH.

A NEW EDITION,

CAREFULLY CORRECTED AND CONSIDERABLY ENLARGED, BY MANY ADDITIONAL ARTICLES, NOTES, AND PLATES,

AND

SOME ACCOUNT OF THE LIFE OF M. DE BUFFON.

BY WILLIAM WOOD, F.L.S.

IN TWENTY VOLUMES.

VOL. VI.

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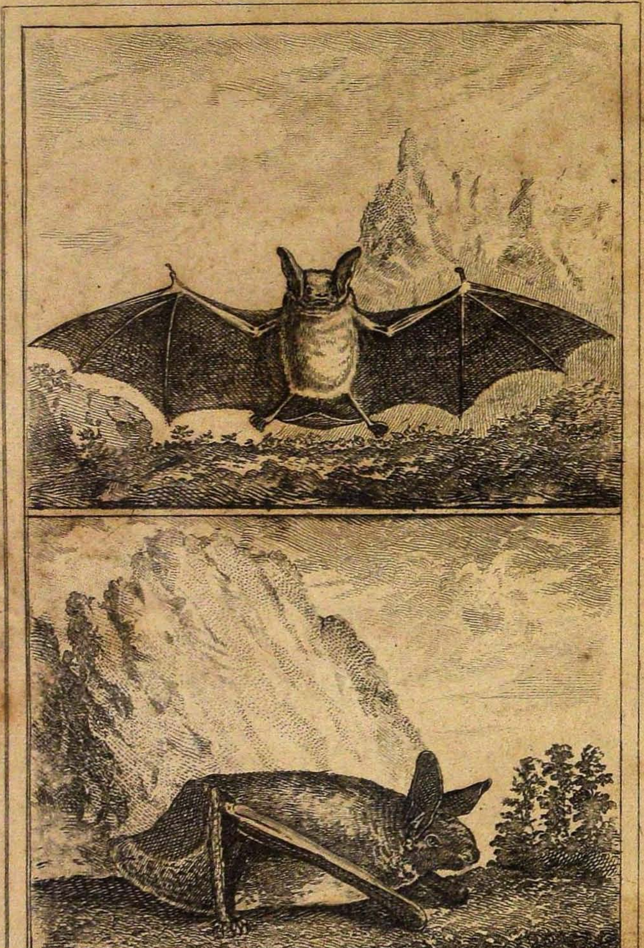
ERRATA.

Page 3, line 10, *for* "bat" *read* bird.
50, note, *for* "μυαξος" *read* Μύοξος.
182, "Δεων" Λεων.



BAT.

NATURAL HISTORY.

THE BAT*.

THOUGH all beings are equally perfect in themselves, since they proceed from the hands

* VESPERTILIO.

CHARACTER GENERICUS.

Dentes omnes erecti, acuminati, approximati.
Manus palmatæ volitantes membrana corpus cingente.
Mammæ duæ pectorales.

CHARACTER SPECIFICUS.

VESPERTILIO MURINUS. V. caudatus, naso oreque simplici, auriculis capite minoribus.—*Linn. Syst. Nat. Gmel.* i. p. 48.

Vespertilio murini coloris auriculis simplicibus.—*Briss. Quadr.* p. 158.

Vespertilio auribus minoribus.—*Frisch. Av.* t. 102.—*Edw. Av.* iv. pl. 201, fig. 2.

VESPERTILIO.—*Gesn. Av.* p. 766.—*Aldrov. Ornith.* p. 575.—*Ray's Quadr.* p. 243.

LA CHAUVE SOURIS.—*Buff. Hist. Nat. par Sonn.* xxv. p. 310, pl. 13.

of the same Creator; yet, in relation to man, some beings are more accomplished, and others seem to be imperfect or deformed. Of the former kind are all those whose figures appear to us to be agreeable and complete; because all their parts and members are proportioned, all their movements and functions are easy and natural. The latter kind of beings, which to us have a hideous aspect, comprehends all those whose qualities are noxious to man, whose nature is uncommon, and whose form differs from the ordinary figures from which we received our primary sensations, and derived those ideas which serve as models to our judgment. The head of a man upon the neck of a horse, and its body covered with feathers, and terminating in the tail of a fish, represents a picture of enormous deformity, for no other reason, but because it unites what

COMMON BAT. — *Penn. Hist. Quadr.* ii. p. 319. — *Bew. Quadr.* p. 474. — *Shaw's Gen. Zool.* i. p. 123.

HABITAT

in Europa, vespera volans. Hybernat in cavis arboribus, intra muros, in ruderatis, e pedibus posticis pendulus alis involutus. *W.*

This animal has long extended toes to the fore-feet connected by thin broad membranes, extending to the hind-legs. —The common bat has short ears, mouse-coloured fur, tinged with red: its length is two inches and a half, and the extent of the wings nine inches. — *Penn. Synops. Quadr.* p. 371.

In Greek, Νυκτερις; in Latin, *Vespertilio*; in Italian, *Nottola, Nottula, Barbastello, Vilpistrello, Pipistrello, Sportegliono*; in German, *Flædermuss*; in Swedish, *Luderlapp*; in Polish, *Nietopersz*.

Nature has placed at the greatest distance. An animal, like the bat, which is half a quadruped and half a bird, and which, upon the whole, is neither the one nor the other, must be a monstrous being; because, by uniting the attributes of two opposite genera, it resembles none of those models presented to us in the great classes of Nature. It is an imperfect quadruped, and a still more imperfect bird. A quadruped should have four feet, and a bat should have feathers and wings. In the bat, the fore-feet, though they serve the animal for the double purpose of flying and of trailing its body on the ground, are neither wings nor feet. They are deformed extremities, the bones of which are enormously lengthened, and united by a membrane, which is neither covered with feathers nor with hair. They are a species of pinions, or winged paws, in which we see only a claw of an inch in length; and the other four long toes must act along with the former; for they have no proper movements or separate functions. They are a kind of hands ten times larger than the feet, and four times longer than the body of the animal. In fine, they are parts which have rather the air of caprice than of a regular production. This membrane covers the arm, forms the wings or hands of the animal, unites with the skin of the body, and, at the same time, surrounds the legs and even the tail, which, by this whimsical conjunction, becomes, in some measure, one of its toes. To these dissimilarities and disproportions of the body and its members, may be added the defor-

mities of the head, which are often much greater: for, in some species, the nose is hardly visible, the eyes are sunk near the ear, and confounded with the cheeks: in others, the ears are as long as the body, or the face is twisted into the form of a horse-shoe, and the nose turned up like a cock's comb. All of them have small, obscure, covered eyes, a nose, or rather nostrils, ill formed, and a mouth extending from ear to ear: they all likewise endeavour to conceal themselves, fly the light, inhabit dark places only, from which they never go out but during the night; they return at break of day, and fasten themselves against the walls *. Their motion in the air is rather a desultory fluttering, than flying, which they execute very awkwardly. With difficulty they raise themselves from the earth, and never fly to any great height: they quicken, relax, or direct their flight, in a manner the most bungling and imperfect. Their flight is neither rapid nor

* The nocturnal flight, together with the hideous appearance of the bat, was probably the reason why the ancients consecrated it to Proserpine, and gave it a corner in her dark regions. It is generally supposed, that the fabulous harpies also originated from the same source, and the resemblance between some of the larger species of bat, and the winged monsters of the ancient mythologists, is indeed sufficient to warrant the supposition. Bryant, however, conceives that the story of the Harpies relates to the priests of the sun, who were named harpi from an oracular temple in which they lived, and that their being figured as birds was only the ensigne of the people, as the vulture and the eagle were of the Egyptians: a lion of the Persians.—*Analysis of Ancient Mythology*, 8vo. ed. vol. ii. p. 307, 308.

W.

direct, but consists of quick vibrations, in an oblique and winding direction *. They fail not, however, in passing, to seize flies, gnats, and particularly moths, which fly during the night only. These they swallow almost entire; and we find, in their excrements, portions of wings, and other dry and indigestible parts of moths. Having one day descended into the caverns of Arcy, to examine the stalactites, I was surprised to find, in a place covered with alabaster, and so dark and

* It appears, from the cruel experiments of Spallanzani, that the eyes of bats are not necessary to guide them in their flight, since he first destroyed them, and then covered the empty sockets with leather. Even in this state the wretched animals continued to fly round the room, without touching the sides or striking against any thing; they likewise flew out at the door, without touching the architraves. The abbé, that he might be certain this ability to dispense with the organ of sight was not confined to the common bat, tried it on several other species with the same success. He adds, that, flying through the middle of a sewer, which turned at right angles, the bats regularly bent their flight at the curvature, though two feet distant from the walls. They found a resting place on the cornice, and even flew through threads hung perpendicularly from the ceiling without touching, though they were scarcely at a greater distance than that of their extended wings, and when the threads were brought nearer they contracted their wings to pass through them. They equally avoided every obstacle, though the whole head was covered with a varnish made of Sandarach dissolved in spirit of wine.

We learn, from another experimentalist, that it is the sense of hearing that preserves the blinded bats from striking against any obstacle to their flight; when their ears were closed, they struck against the sides of the room without being at all aware of their situation. *W.*

profound, a kind of earth which was totally different: it was a thick mass, several feet in extent, of a blackish matter, almost entirely composed of fragments of the wings and legs of flies and moths, as if immense numbers of these insects had assembled in order to die and corrupt together. This, however, was nothing else but the dung of bats, probably amassed during many years in a favourite part of these subterranean caverns; for, through the whole of these caverns, which extend above half a quarter of a league, I saw no other collection of this matter; and I imagined that the bats had fixed upon this place for their common abode; because it was reached by a glimmering light from an aperture in the rock, and that they chose not to go farther, lest they should be lost in a darkness too profound.

Bats are real quadrupeds: except the faculty of flying, they have nothing in common with birds. But, as the action of flying implies great strength in the upper and anterior parts of the body, the bats have their pectoral muscles much stronger and more fleshy than those of quadrupeds; and in this they have an affinity to the birds. They differ from birds, however, in every other part of their structure, both external and internal: the lungs, the heart, the organs of generation, and all the other viscera, are similar to those of quadrupeds, except the penis, which is pendulous and loose, a thing peculiar to man, the monkeys, and the bats. Like the quadrupeds, the bats are viviparous, and have teeth and paps. It is said, that they bring forth but two

at a time, and that they suckle their young, and even carry them when flying. In summer they copulate and bring forth; for they are in a torpid state during winter. Some cover themselves with their wings as with a mantle, and suspend themselves by the hind-feet to the vaults of subterraneous caverns; others stick fast to old walls, or retire into holes. Wherever they take up their winter abode, they always assemble in such numbers as to secure them against the effects of cold. They pass the winter without food or motion, never awake till the spring, and again retire at the end of autumn. They support hunger better than cold: though carnivorous animals, they can subsist several days without food. When they get into a larder, they fix upon the suspended meat, and eat flesh whether raw or roasted, fresh or corrupted.

Two species of bats only have been described as natives of our climate. Beside these, M. Danbenton has discovered other six, which are equally numerous and common. It is astonishing, therefore, that they should so long have escaped notice. These species are perfectly distinct, and never associate together.

The first, which is well known, is the common bat, of which we have already given the synonimes.

The second, or long eared *, is likewise known

* Bat with ears an inch long, thin, and almost pellucid; the body and tail are only one inch and three quarters long. This and all other bats, except the *Ternate* and the *horse-shoe*, have a lesser or internal ear, serving as a valve to close the

to the naturalist, and is perhaps still more numerous than the common bat. The long-eared bat is much less than the common species; its wings are likewise shorter, and its muzzle smaller and sharper, and its ears of an immoderate size.

The third species, which we shall denominate the *Noctule*, from the Italian word *notula*, was not known, though very common in France, and even more frequent than the two preceding species. This bat is found under the eaves of houses, castles, and churches, and also in the hollows of old trees. It is nearly as large as the common bat. Its ears are broad and short, its hair reddish, and it has a sharp piercing voice, like the sound of a small bell *.

The fourth species we shall call the *Serotine*. It is smaller than the common bat or noctule, and nearly of an equal size with the long-eared bat. But it differs from the latter in having short pointed ears, blacker wings, and the hair of a deeper brown †.

greater when the animal is asleep—*Penn. Synops. Quadr.* p. 371.

Vespertilio auritus, naso oreque simplici, auriculis duplicatis, capite majoribus.—*Linn. Syst.* p. 47.

* The noctule has the nose slightly bilobated; ears small and rounded; on the chin a minute verruca; hair of a reddish ash-colour; length to the rump two inches eight tenths; tail one inch seven tenths; extent of the wings thirteen inches.—*Penn. Synops. Quadr.* p. 369.

† The serotine has a longish nose, and short ears, but broad at the base; the hair on the upper part of the body is brown mixed with ferruginous, and the belly of a paler colour. The length, from nose to rump, is two inches and a half.—*Penn. Synops. Quadr.* p. 370.

The fifth species we shall name *Pipistrelle*, from the Italian word *pipistrello*, which likewise signifies a bat. The pipistrelle is not near so large as the common bat, the serotine, the noctule, or even the long-eared kind. It is the smallest and least ugly of all the bats, though the upper lip is turgid, the eyes small and deep sunk, and the front much covered with hair *.

The sixth species I call *Barbastelle*, from the Italian word *barbastello*, which also signifies a bat. This animal is nearly of the same size with the long-eared species: its ears are as broad, but not near so long. The name *barbastelle* is the better adapted to it, because it appears to have large whiskers: this, however, is only an appearance occasioned by the turgidness of the cheeks, which form a kind of pudding above the lips. The muzzle is very short, the nose much flattened, and the eyes near the ears †.

Lastly, we shall call the seventh species the

* The pipistrelle has a small nose; the upper lip swells out a little on each side; the ears are broad, and the forehead covered with long hair: the colour of the upper part of the body is a yellowish brown, that of the lower part dusky, and the lips are yellow. It is the least of bats, not one inch and a quarter long to the rump; the extent of the wings six inches and a half.—*Penn. Synops. Quadr.* p. 370.

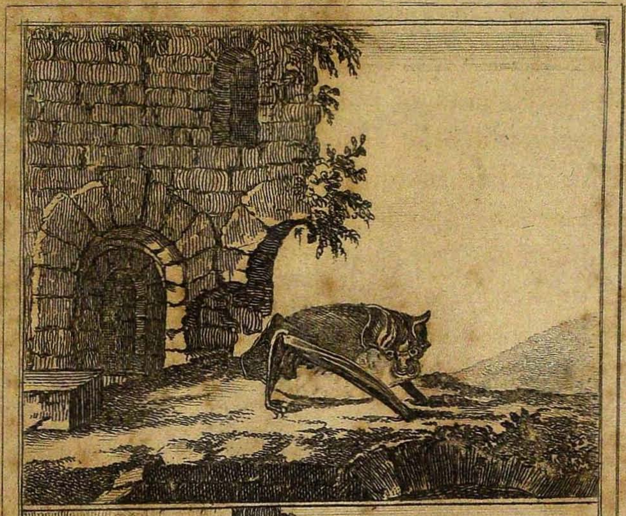
† The barbastelle has a sunk forehead, long broad ears, the lower part of the inner sides, touching each other, conceal the face and head, when looked at in front; the nose is short, and the end of it flatted; the cheeks are full; the upper part of the body is of a dusky brown, the lower ash-coloured and brown: its length to the rump about two inches, and the extent of the wings ten and a half.—*Penn. Synops. Quadr.* p. 370.

horse-shoe. The countenance of this animal is remarkably deformed. The most striking feature is a membrane in the shape of a horse-shoe, which surrounds the nose and the upper lip. In France it is very common, and frequents the walls and vaults of old houses. Some of them are larger, and others smaller; but they are otherwise so similar in form, that we consider them as of the same species. But, as I have remarked this difference, without finding any of an intermediate size, I cannot determine whether it is an effect of different ages, or a constant variety in the same species *.

* This bat has a membrane at the end of the nose in form of a horse-shoe; the ears are long, broad at the base, and sharp pointed, inclining backward: it wants the little or internal ear. Colour of the upper part of the body cinereous; of the lower, whitish. There is a greater and less variety; the greater is above three inches and a half long from the nose to the tip of the tail; the extent of its wings above fourteen.—*Penn. Synops. Quadr.* p. 360.

SMALL HORSESHOE BAT.

Plate 130

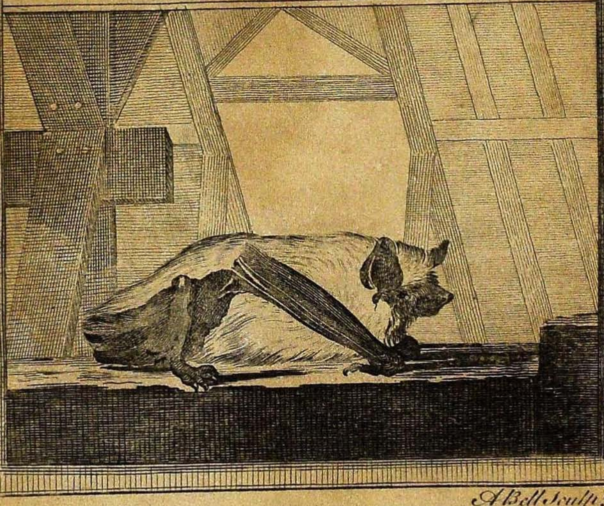


LONG EARD BAT.

10

Plate 131

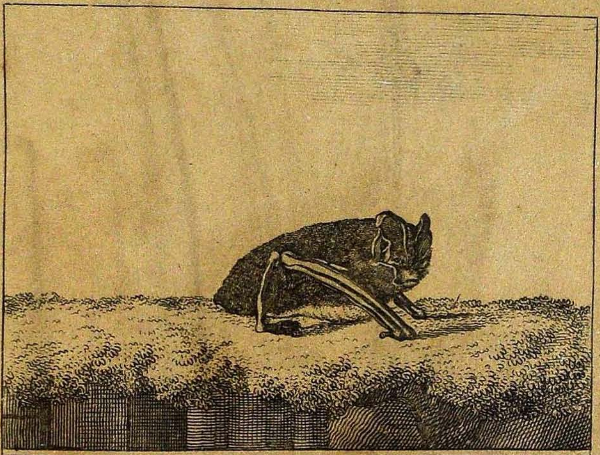
NOCTULE.



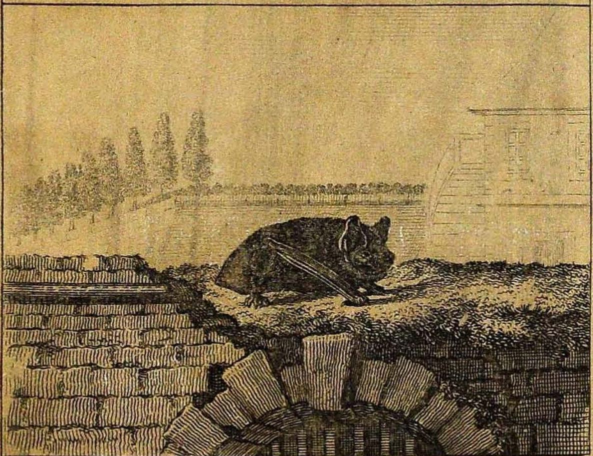
A Bell Sculpt.

SEROTINE.

Plate 132



BARBASTELLE.

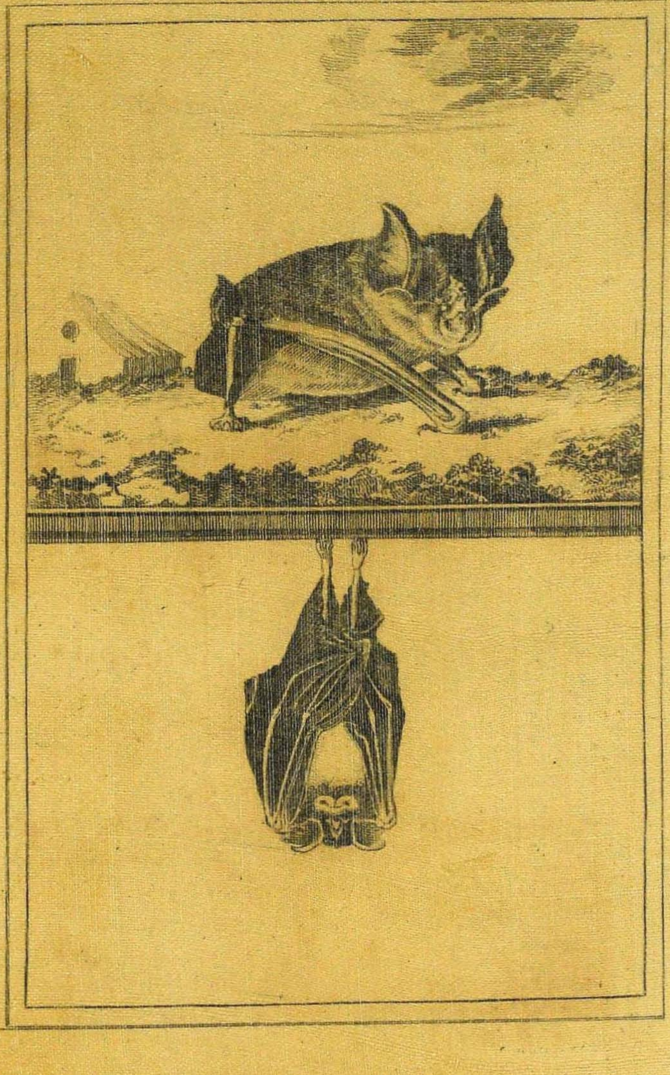


PIPISTRELLE.

10

HORSE SHOE BAT

Plate 133



HORSE SHOE BAT
Suspended by the Feet.

THE TERNAT BAT*, THE LESSER TERNAT BAT†, AND THE VAMPIRE, OR SPECTRE‡.

THOUGH the two Ternat bats appear to be distinct species, we have placed them together,

* CHARACTER SPECIFICUS.

VESPERTILIO VAMPYRUS. V. ecaudatus, naso simplici, membrana inter femora divisa. —*Linn. Syst. Nat. Gmel.* i. p. 45.

Pteropus rufus aut niger, auriculis brevibus acutiusculis, —*Briss. Quadr.* p. 153.

VESPERTILIO INGENS. — *Clus. Exot.* p. 94.

VESPERTILIO VOLANS. — *Bont. Java*, 68, pl. 69.

Canis volans ternatanus orientalis. — *Seb. Mus.* i. p. 91, t. 57, fig. 1 and 2.

CHIEN VOLANT. — *Daubent. Act.* Paris, 1759, p. 384.

LA ROUSETTE. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 111, pl. 7.

TERNAT BAT. — *Penn. Hist. Quadr.* ii. p. 304, pl. 103.

VAMPIRE BAT. — *Shaw's Gen. Zool.* i. p. 144, pl. 44.

α. V. Corpore Stramineo.

LA ROUGETTE. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 111, pl. 7.

LESSER TERNAT BAT. — *Penn. Hist. Quadr.* ii. p. 305.

HABITAT

in Africa occidentali, Asia meridionali, insulis oceani indici,

because of their great resemblance; for they differ only in magnitude and colour. The

et Australis. Gregarium animal, æerem obscurans, dum volat, ob copiam apum examinis instar arboribus adhærens.

W.

The great or Ternat bat has large canine teeth, four cutting teeth above, and an equal number below, a sharp black nose, and large naked ears. The tongue is pointed, and terminated by sharp aculeated papillæ. The exterior toe is detached from the membrane, and the claw is strong and hooked. There are five toes on the hind-feet; the talons are very crooked, strong, and compressed sidewise. It has no tail; the membrane is divided behind quite to the rump. The head is of a dark ferruginous colour: on the neck, shoulders, and under side, the red is much lighter and brighter. On the back, the hair is shorter, dusky, and smooth. The membranes of the wings are dusky. They vary in colour; some are entirely of a reddish brown, others dusky. This now described was one foot long, and the extent of the wings, from tip to tip, was four feet. But they are found vastly larger. — *Penn. Synops. Quadr.* p. 359.

† M. Brisson has separated with propriety the Ternat bats from the common bat. Linnæus is wrong, when he says, that all bats have four cutting teeth in each jaw. This character is true in the Ternat bats; but the common bats have four cutting teeth in the upper jaw, and *six* in the under; and, consequently, according to Linnæus's method of classing by the number and arrangement of the teeth, these animals cannot belong to the same genus.

‡ CHARACTER SPECIFICUS.

Vespertilio Spectrum. V. ecaudatus, naso infundibuliformi lanceolato. — *Linn. Syst. Nat. Gmel.* i. p. 46. — *Schreb.* i. p. 159, pl. 45.

Pteropus auriculis longis patulis, naso membrana antrorsum inflexa aucto. — *Briss. Quadr.* p. 154.

Pteropus Spectrum. — *Erxleb. Mamm.* p. 133.

Canis volans maxima aurita ex nova Hispania. — *Seb. Mus.* i. p. 92, t. 58, fig. 1.

larger, whose hair is of a reddish brown colour, is nine inches long from the end of the muzzle to the extremity of the body; and the wings, when extended, are three feet from tip to tip; and the lesser, whose hair is of a cinereous brown colour, exceeds not five and a half inches in length, and the wings extend not above two feet; and it has on the neck a half collar of a lively red, mixed with orange, of which there is no vestige in the larger kind. Both belong nearly to the same warm climates of the Old World, being found in Madagascar*, Mauritius, Ternat, the Phillippines, and other islands of the Indian

La Vampire. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 111.

Spectre Bat. — *Penn. Hist. Quadr.* ii. p. 308. — *Shaw's Gen. Zool.* i. p. 143, pl. 43.

HABITAT

in America australi, Palmis inhærens. Valde pinguescit.

W.

The vampire or spectre has a long nose, large teeth, and long, broad, upright ears. At the end of the nose there is a long, conic, erect membrane, bending at the end, and flexible. The hair on the body is cinereous, and pretty long. The wings are full of ramified fibres. The membrane extends from hind-leg to hind-leg. It has no tail; but from the rump extend three tendons, terminating at the edge of the membrane. By Seba's figure, the extent of the wings is two feet two inches, and from the end of the nose to the rump, seven inches and a half. — *Penn. Synops. Quadr.* p. 363.

* In the island of Madagascar, &c., the bats are as large as hens, and so numerous that they frequently darken the air. Their cry is frightful. — *Voyage de Madagascar, par de V.* p. 33 and 245.

Archipelago, where they seem to be more common than on the adjacent continents.

In the warm countries of the New World, there is another flying quadruped, the American name of which we have not learned. We shall call it *vampire*, because it sucks the blood of men and other animals when asleep, without occasioning pain sufficient to waken them. This American animal is of a different species from the two Ternat bats, both of which are peculiar to Africa and the south of Asia. The vampire is smaller than either of the Ternat bats. The first, when it flies, appears to be of the size of a pigeon; the lesser Ternat bat is of the size of a crow, and the largest is as big as a large hen. Both Ternat bats have well formed heads, short ears, and rounded muzzles, nearly resembling that of a dog. The muzzle of the vampire, on the contrary, is longer; its aspect is equally hideous as that of the most ugly bats; its head is ill shaped; and its ears are large, open, and very erect. It has a deformed nose, the nostrils being of the shape of a funnel, with a membrane above them, which is elevated like a horn or painted crest, and adds greatly to the deformity of its countenance. Hence it is apparent, that this species is totally different from the Ternat bats. The vampire is not more remarkable for its deformity than its mischief. Of this we have the recent and authentic testimony of M. de la Condamine: "The bats," says he, "which suck the blood of horses, mules, and even of men, if they do not sleep under the shelter of a house or

tent, are a common scourge to most of the warm countries of America. Some of them are of a monstrous size. At Borja, and several other places, they have entirely destroyed the cattle which had been introduced there by the missionaries, and begun to multiply*. These facts are confirmed by several other historians and travellers. P. Martyr†, who wrote soon after the conquest of South America, says, that, in the Isthmus of Darien, there are bats which suck the blood of men and cattle, when asleep, to such a degree as to weaken and even kill them. This fact is likewise affirmed by Jumilla‡, as well as

* Voyage de la Riviere des Amazones, par M. de la Condamine, p. 171.

† In Dariene, novi orbis regione, Hispani noctu vespertilionum morsibus torquebantur, quæ si dormientem forte momorderint quempiam, exhausto sanguine trahunt in vitæ discrimem, et mortuos fuisse nonnullos ex ea tabe compertum est; *Petrus Martyr*, Oceani decadis tertiæ, lib. 6.

‡ In South America, the bats are incredibly troublesome. There are two kinds, one of the size of those we see in Spain; the other so large, that the wings extend three quarters of a yard. Both are dexterous blood suckers, and fly about during the night in quest of men and cattle. If those who are obliged to sleep on the ground do not cover themselves from head to foot, which is very inconvenient in these warm regions, they are certain of being pierced by the bats. With regard to those who sleep in houses, with their front only uncovered, they are infallibly bit; and, if these animals strike a vein, the unfortunate person often passes insensibly from sleep to death by the loss of blood, so subtile is the wound inflicted: besides, by fanning the air with their wings, they refresh the sleeper whom they mean to deprive of life.—*Hist. Nat. de l'Orenoque, par le Père Jumilla*, tom. iii. p. 100.

Don George Juan, and Don Antoine de Ulloa*. Though it appears from these authorities, that the blood-sucking bats are very common in all South America, we have never hitherto been able to procure a single individual. But Seba has given a figure and description of this animal, whose nose is so extraordinary, that it is surprising such a conspicuous deformity should not have been taken notice of by travellers. The strange animal described by Seba, may not be the vampire or blood-sucker. Seba's figure may be erroneous; and the deformed nose may be only an accidental monstrosity, though there are examples of similar and permanent deformities in other species of bats. Time alone can remove these uncertainties.

Both the Ternat bats are in the Royal Cabinet, and were brought from the isle of Bourbon. They are peculiar to the Old Continent, and are no where so numerous in Africa and Asia, as the vampire is in America. These animals are larger, stronger, and perhaps more mischievous than the vampire. But their destruction is executed by open force, both during the day and the night. They kill poultry and small birds: they attack men, and often wound them in the face. But no traveller mentions their sucking the blood of men or cattle, when asleep.

The ancients had an imperfect knowledge of

* Bats are very numerous at Carthagena; they bleed the inhabitants so dexterously, and without wakening them, as to enfeeble them extremely.—*Biblioth. Raisonée,* tom. xliv. p. 409.

these winged quadrupeds, which are a kind of monsters; and it is probable, that, from such whimsical models of Nature, they had conceived the idea of harpies. The wings, the teeth, the claws, the cruelty, the voracity, the filthiness, and every other deformity and destructive quality ascribed to the harpies, correspond very well with our Ternat bats. Herodotus * appears to point them out, when he says, that there were large bats which were extremely troublesome to the people who gather cassia around the marshes of Asia; and that they were obliged to cover their bodies and faces with leather, to defend themselves against the dangerous bites of these animals. Strabo † speaks of large bats in Mesopotamia, whose flesh was good to eat. Among the moderns, Albertus, Isidorus, and Scaliger, mention these large bats in a vague manner. Linscot, Nicolas Matthias ‡, and Francis Pyrard §, have

* Herodot. lib. iii. It is singular that Pliny, who has related so many marvellous stories, should here accuse Herodotus of falshood, and treat the fact of bats attacking men, as a mere fable of antiquity.

† In Mesopotamia, inter Euphratis conversiones, est maxima vespertilionum multitudo, qui longe majores sunt quam in cæteris locis. Capiuntur, et in esum condiuntur.—*Strabo*, lib. xvi.

‡ Nicolas Matthias, in a work printed at Visurgbourg, in Sweden, says, p. 123, that these large bats fly in flocks during the night; that they drink the juice of the palm-trees in such quantities as render them intoxicated, and make them fall, as if they were dead, at the roots of the trees; that he seized one in this condition, and having nailed it to a wall, it gnawed and rounded the nails with its teeth, as if they had been filed. He adds, that its muzzle resembles that of a fox.

§ In the island of St. Lawrence, and in the Maldiva islands,

made more particular mention of them; and Olliger Jacobeus* has given a short description, and a figure of them. Lastly, descriptions and good figures of these animals, which correspond with our specimens, are to be found in Seba and Edwards.

The Ternat bats are carnivorous animals, and so voracious, that they eat every thing; for, when flesh or fish fail them, they feed upon vegetables, and fruits of all kinds†. They drink the juice of the palm-tree; and it is easy to intoxicate and seize them, by placing near their retreats vessels filled with palm-water, or some other fermented liquor.

there are bats as large as crows.—*Voyage de Pyrard*, tom. i. p. 38, 132. In Malabar, the bats fly at noon day; they are as large as cats, and people eat them without reluctance.—*Biblioth. Raisonée*, tom. xxxii. p. 194.

* There are two of these bats in the *Museum Regiam Haffniæ*, 1696, p. 12, t. 5, fig. 3. He says, that each of them were of the size of a large crow; that they were a foot long; and that the length of the penis was two inches. He adds, after Linscot, that they were eaten by the Indians, who thought them as delicate as partridges.

† In the Manilla islands, we find an infinity of large bats hanging attached to each other upon the trees. They take flight in the evening, and go in quest of food to the distant woods. They sometimes fly in such numbers, and so close, that they darken the air with their wings, which are often six palms in extent. They know how to distinguish, in the thickest woods, the trees which bear ripe fruit. These they devour, during the night, making a noise that may be heard at the distance of two miles, and return at day-break to their retreats. The Indians, who see these animals eating their best fruits, make war against them, not only to gratify revenge, but to feed upon their flesh, which they say tastes like that of a rabbit.—*Hist. Gen des Voyages, par M. l'Abbé Prevost*, tom. x. p. 359.

They attach and suspend themselves to the trees by their claws. They generally fly in flocks, and more frequently in the night than the day. They avoid places frequented by men, and dwell in the deserts, particularly in uninhabited islands. They copulate with ardour. The sex in the male is very conspicuous. The penis is not concealed in a sheath like that of quadrupeds, but hangs out of the body, like that of the monkey *. The sex of the females is also very apparent. They have only two paps placed on the breast, and they produce few at a litter, but oftener than once a year. The flesh of these animals, when young, is not bad to eat; the Indians compare the taste of it to that of a partridge or rabbit.

All travellers through America agree, that the large bats of the New Continent have the faculty of sucking the blood of sleeping men and cattle, without wakening them. The travellers into Asia or Africa, who mention the Ternat bats, take no notice of this singular fact. Their silence, however, amounts not to a complete proof, especially as these creatures have so many other resemblances to the American vampires. We therefore thought it worthy of examination, whether the Ternat bats (for we have not been able to procure the tongue of a vampire), could

* In hoc animali uterque sexus dignoscebatur: nam eorum aliquot, qui mihi conspecti sunt, satis longum exertumque penem habebant, quales ferè simiarum est. — *Carol. Clusii Exotic.* tom. ii. p. 94.

possibly suck blood, without occasioning a pain sufficient to waken a sleeping person. If they cut the flesh with their teeth, which are as large as those of other quadrupeds of the same size, a man in the most profound sleep, and particularly cattle, whose sleep is less profound, would be instantly roused by the pain. The same thing would happen, if the wound was made by their claws. Hence it must be with their tongue alone that they are enabled to make such small apertures in the skin as to permit the blood to be extracted from the veins, without occasioning a great degree of pain. Upon examination, M. Daubenton discovered that the tongue of the Ternat bats was pointed, and armed with very hard, minute, sharp papillæ, which are bended backwards: these may be insinuated into the pores of the skin, and penetrate so far as to make a stream of blood flow by the constant suction of the tongue. But it is fruitless to reason upon a fact, all the circumstances of which are not understood, and some of them, perhaps, exaggerated or unskilfully related *.

* Captain Stedman, during one of his military excursions through the woods of Surinam, was bitten by a vampire bat, while sleeping in his hammock. He was extremely alarmed one morning, about four o'clock, when he awoke and found himself weltering in congealed blood without feeling the least degree of pain. He applied tobacco ashes to the wound, and observed several small heaps of congealed blood round the place where he had lain, from which the surgeon judged that he had lost at least twelve or fourteen ounces during the night. *W.*

M. Roumé de Saint Laurent wrote me from Grenada, dated April 18, 1778, on the subject of the great bat, or vampire of the island of Trinity. The remarks of this judicious observer confirm all we have said on the wounds made by the vampire, and on the particular manner in which he sucks the blood, and excoriates the skin in wounding it. I have conjectured the mechanism; however, a love of truth, and a scrupulous attention to relate all that may serve to throw light upon it, has led me to give, on this subject, the evidences which seem to contradict my opinion; but I have ascertained that it was well founded, and that Messrs. Saint Laurent and Gaulthier have observed all I have presumed on the manner in which these animals wound without pain, and suck the blood till they exhaust the body of a man, or animal, to death.

I find, from a note communicated by M. Commerson, that he had seen, in the isle of Bourbon, millions of these large or Ternat bats, which, in the evenings, fly in flocks like crows, and perch upon trees, particularly the *vaccoun*, to eat the fruit. He adds, that, when taken young, they are good food, the taste of the flesh resembling that of the hare, and being equally black.

The late M. de la Nux sent me, from the same island, some excellent remarks upon what I have written concerning these animals. His letter, of which the following are extracts, is dated October 24, 1772:

" In your letter of the 8th March, 1770, you

declare that you are equally happy to be informed of truth, or to have your own errors corrected, and invite me to communicate my thoughts and remarks with the utmost freedom. I accept of the invitation, and am only afraid lest I should tire you by prolixity. With regard to the great or Ternat bats, to combat errors which have been long received, requires a variety of evidence. These animals, it would appear, have only been examined with the eye of fear; they have been regarded as ugly and monstrous; and, therefore, without farther examination than a bare inspection of their figure, they have received a character, manners, and habits, which do not belong to them; as if mischievousness, ferocity, and dirtiness, were inseparable from ugliness of aspect."

M. de la Nux remarks, that, in my description, both the size and number of the great Ternat bats are exaggerated; that there is nothing frightful in their cry; that it resembles the hoarse noise made by a man when he opens his mouth, contracts the wind-pipe, and makes several forcible expirations and respirations; and that, when these animals are at rest on a tree, they make a gentle kind of murmuring, which is not disagreeable.

"Pliny, with reason," continues our author, "treats the narrative of Herodotus as fabulous. The Ternat bats, at least in the islands, instead of attacking men, uniformly avoid men. They bite cruelly, but only when defending themselves from blows, or when they are seized; so that,

whoever is wounded by them, must ascribe his misfortune to his own want of address, and not to the ferocity of an animal that has no such quality.

"Here the size of the great Ternat bat approaches nearer to the truth. . . . See p. 18, Notes. *In Malabar, the bats fly at noon-day.* This is true of the larger, but not of the lesser Ternat bats. The former fly not in troops during the day, but singly, when they mount very high, which greatly diminishes their apparent magnitude. They fly long without stopping, and I believe that they can pass from the isle of Bourbon to the isle of France, a distance of at least thirty leagues, in a very short time. They never hover, like birds of prey. But, in the great elevation of perhaps two hundred fathoms above the surface of the earth, the motion of their wings, which is rapid when near the ground, appears to be very slow.

"Strictly speaking, the great Ternat bats live not in society. When in quest of food, they unite into flocks or companies more or less numerous. These companies associate by accident upon the trees whose flowers or fruits are agreeable to their palates. They may be observed arriving successively, and laying hold of the trees by the claws of their hind-feet, where they rest for a long time, if not disturbed. There are always some, however, which detach themselves from time to time, and join the company. But, when a bird of prey passes above the tree, when they hear the noise of thunder, or of a musket,

or when they spy any person in their neighbourhood, they all take wing at once. It is on such occasions that they are seen, during the day, flying in companies, which, though numerous, never obscure the air, because they cannot fly close enough to produce this effect: the expression is at least hyperbolical. But to say, that *an infinity of large bats may be seen attached to each other upon the trees*, is not only false, but absurd. They are too peevish to hold each other, in this manner, by the hand; and, if we examine their figure, the impossibility of such a concatenation will be apparent. They rest on the branches above, below, or at each other's sides; but always remain separate.

"With regard to the lesser Ternat bats, they never fly in the day: they live in society, to the number sometimes of more than four hundred, in the hollow trunks of large corrupted trees, from which they depart not till the dusk of the evening, and return before day-break. It is firmly believed in this island, that, whatever numbers these societies consist of, there is never more than one male found among them: but I cannot attest this fact. I shall only remark, that these sedentary animals acquire a great degree of fatness, and that, when this colony was first established, many people, whose taste and stomach were not too nice, collected vast quantities of bat grease for food. I have seen the time when a *tree of bats*, as it is termed, was no inconsiderable treasure. It is easy to shut up the entrance of their retreats, to take them out alive

one by one, or to suffocate them with smoke, and in either way to ascertain the number of males and females of which the society is composed. I know nothing more of this species. I return to the notes. . . . . . Another hyperbole: p. 18. *They know how to distinguish, in the thickest woods, the trees which bear ripe fruit. These they devour during the night, making a noise that may be heard at the distance of two miles.* . . . . . In reading this passage, we are led to ascribe the noise to the act of mastication. The noise that is heard at a great distance, both in the night and the day, is that which is natural to the animals when in a passion, and when disputing about their food; for it must not be imagined that the large Ternat bats eat during the night only. They have a fine eye, as well as an acute scent. They see very well in the day; and it is not surprising that they should distinguish, in the woods, ripe fruit and grain, as well as flowers. Besides the bananas of every kind, of which they are very fond, the peaches and other fruits cultivated by the Indians, are not in the thickest parts of the woods. . . . . *The flesh of these animals*, p. 19, *is not bad*. . . . . True, if the reluctance excited by their figure could be overcome. When about five months old, they are fat, and as good of their kind as the Guinea hen, or young wild boar; but, when old, they are hard, though pretty fat during the fruit season, which continues all the summer and a part of autumn. The males, especially when aged, acquire a strong, disagreeable flavour. . . . . Neither is it

correct to say, in general, that these animals *are eaten by the Indians.* It is well known, that the Indian neither eats nor kills any animal. Perhaps they are eaten by the Moors and Malayans. It is certain, that many Europeans eat them. Hence it is true, that bats are eaten in India, though not by the Indians. In this island, both species are eaten.

"After this examination, I proceed to the history of these animals, which likewise requires to be rectified. My proofs shall be drawn solely from my own observation, and from what has been alleged by those writers whom our historian of Nature has followed.

"Both the great and lesser Ternat bats are natives of the isles of France, of Bourbon, and of Madagascar. I have resided in the isle of Bourbon upwards of fifty years. When I arrived in the month of September, 1722, these animals were very common in districts already settled, where they are now become rare. The reasons are obvious: 1. The forests were then at no great distance from the settlements; and they cannot subsist but in forests. 2. The great Ternat bats are viviparous, and bring forth one young only each year. 3. For the sake of their flesh and their grease, they are hunted, during the whole summer, autumn, and part of winter, by the Whites with muskets, and by the Negroes with nets. Besides these causes of diminution in the species, they abandon the neighbourhood of our settlements, and retire into the interior parts of the island, where they are exposed to

constant destruction by the chesnut coloured Negroes.

"The season of their amours here is in the month of May, which is about the middle of our autumn, and the females bring forth a month after the vernal equinox. Hence the time of their gestation is from four and a half to five months. Of the precise time the young take in acquiring their full growth, I have no knowledge: but I know that they appear to be perfect at the winter solstice, which is nearly eight months from their birth. Besides, no small bats are seen, except in April and May, when the old are easily distinguished from the young, by the more vivid colour of the latter. The old ones become gray, though I know not at what period; and it is then that their flesh is hard, and has so strong and disagreeable a flavour, that the fat alone, with which they are well provided from the end of spring to the beginning of winter, is eaten by the Negroes.

"It is certain, that these animals feed upon no kinds of flesh, but solely on bananas, peaches, and other fruits, which our forests produce abundantly in different seasons. They are likewise very fond of the juices of certain umbellated flowers, particularly those of our stinking tree, the nectarium of which is very short. These flowers abound in January and February, which is the middle of our summer, and allure into the lower parts of the island vast numbers of bats; and it is probable, for the purpose of sucking the nectaria of umbellated flowers of different

species, that their tongue is furnished with so many sharp papillæ. The skin of the mango fruit is resinous, and is never touched by the bats. When confined in a cage, they have been made to eat bread, sugar-canes, &c. I know not, however, whether they were made to eat flesh either raw or roasted. But supposing they had, it is not in a state of slavery that I am considering them; for bondage changes the manners, characters, and habits of all animals. Man has nothing to apprehend from these bats, either personally, or for his poultry. It is impossible for them to seize even the smallest bird. They cannot, like a falcon, stoop down upon their prey. If they approach too near the ground, they fall down, and are incapable of resuming their flight till they climb upon any elevated object they first meet with, supposing it should be the body of a man *. When on the ground, they trail their bodies slowly along, and make their stay in that situation as short as possible. As they are by no means adapted for running, how is it practicable for them to seize birds on the branches of trees? The slow and awkward manner in which they move towards the end of a branch, in order to catch the wind in their wings, shows that every attempt of this nature would be abortive.

* I saw a young Ternat fly into my house in the dusk of the evening, and fall down at the feet of a Negress about eight years of age. It instantly began to climb up the child's body, who was luckily very near me. I quickly relieved her, lest the claws of its wings should have scratched her shoulders or face.

When about to fly, these animals cannot, like birds, dart at once into the air. To disengage their claws from the place to which they are attached, they are obliged to beat the air several times with their wings; and, however full their wings may be when they quit their station, their weight is apt to make them sink. In order to raise themselves, they traverse the concavity of a curve line. But the place from which they depart is not always commodious for the free play of their wings. They may be restrained by the vicinity of branches; and, when thus situated, they proceed to the part of the branch from which they can take wing without any risk. It frequently happens, that, when a numerous flock rest upon trees of twenty or thirty feet high, and are surprised by a peal of thunder, or the firing of a gun, several of them fall to the ground before they receive a sufficient quantity of air to support them. In this case, they instantly climb the first tree they meet with, in order to resume their flight as soon as possible. Let us suppose that a traveller, hunting animals of which he has no knowledge, whose figure and aspect strike him with terror, is suddenly surrounded with a number of large bats; that he is entangled by one or two of them climbing up his body; that, by roughly endeavouring to disengage himself, he irritates the animals, and is scratched, or even bit by them; would not a scene of this kind give rise to the notion, that these bats were ferocious, rushing upon men, in

order to wound or devour them, while the whole affair is only a fortuitous rencounter of animals of different species, who are equally afraid of each other? I say more: the forest is absolutely necessary to the existence of these bats, to which they are led by the instinct of self-preservation, and not by any savage or ferocious disposition. When to all these facts I add, that neither the great nor lesser Ternat bats ever fix upon carrion, and that naturally they do not eat upon the ground, but require to be in a hanging posture when they feed, I think I have said enough to eradicate the prejudice which represents them as carnivorous, voracious, destructive, and cruel animals. When I farther add, that their flight is as heavy and noisy, especially when near the ground, as that of the vampire ought to be light and silent, I shall have, by this last character, removed the one species to a considerable distance from the other.

Because the great Ternat bats are sometimes observed flying near the surface of the water, like the swallow, they have been represented as feeding upon fish. But this flesh is equally disagreeable to them as all other kinds; for, I repeat it, that they live entirely on vegetables. It is solely for the purpose of bathing that they frequent the waters; and, if they fly nearer the surface of the water than the earth, it is owing to the fewer interruptions presented by the former to the motion of their wings. To this circumstance the natural cleanliness of these animals

must be ascribed. I have seen, and I have killed numbers, and never discovered the smallest degree of dirtiness upon any of them.

"The great bat is by no means a beautiful animal. When seen nigh, its movements are all disagreeable. There is only one point of view, a single attitude, in which all its natural deformity disappears, and in which it may be observed with pleasure. When perched on a tree, it hangs with its head down, and its wings folded, and placed exactly on each side of the body. In this situation, the vibrating wings which constitute its deformity, as well as the hind paws, by the claws of which it is suspended, are concealed. We see only a roundish, plump, pendulous body, covered with deep brown hair, extremely clean and smooth, terminated by a head whose physiognomy is vivacious, and by no means disagreeable. This is their only attitude of repose, in which they remain a long time during the day. They are seen to best advantage at an elevation above the earth from forty to sixty feet, and at the distance of about one hundred and fifty feet. Now, figure to yourself a large tree, whose branches are garnished with one hundred and fifty or two hundred of such objects, having no other motion but what is communicated to them by the branches, and you will have an idea of a picture, which I have regarded as curious, and contemplated with pleasure. In the richest cabinets of natural history, the great Ternat bat is always shown with its wings fully extended, which is its most ugly attitude. This position

may answer one purpose. But some of them ought to be viewed at a side, or from above, in their natural state of repose. The one represented in your work is not just; for these animals never rest on the ground with their four feet.

"I shall finish my notes, by remarking, that both species afford a wholesome nourishment; for, though their flesh is often devoured to excess, it was never known to be hurtful. Neither should this fact excite surprise, when it is considered that these animals feed entirely on ripe fruits, the juices, flowers, and perhaps the exudations of a number of trees. The last I was induced to believe from a passage in Herodotus. But I have not been able to ascertain the truth of it by actual observation."

THE SENEGAL BAT*.

THE count de Buffon's description of this bat is precisely the same with that given in the note †. The author adds, that this animal has twenty-eight teeth, two incisive in the upper jaw, six in the under, and two canine and eight grinders in

* CHARACTER SPECIFICUS.

VESPERTILIO NIGRITA. — V. caudatus ex flavescente fuscus, capitis parte anteriore, pedibus caudaque nigris. — *Linn. Syst. Nat. Gmel.* i. p. 49. — *Schreb.* i. p. 171, pl. 58.

Vespertilio auriculis brevioribus, caudæ apice extra membranam prominente, valvulis aurium acuminatis. — *Erxleb. Mamm.* p. 151.

MARMOTTE VOLANTE. — *Daubent. Act. Paris,* 1759, p. 385.

LA CHAUVE-SOURIS ETRANGERE. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 144, pl. 8, fig. 1.

SENEGAL BAT. — *Penn. Hist. Quadr.* ii. p. 312. — *Shaw's Gen. Zool.* i. p. 138.

HABITAT

circa Senegal fluvium. *W.*

† This bat has a long head; the nose is a little pointed; the ears are short and pointed; the head and body are of a tawny brown mixed with ash-colour; the body is paler; the two last joints of the tail extend beyond the membrane; its length, from nose to rump, is above four inches, and the extent of the wings twenty-one inches; the membrane of the wings and tail is black. — *Penn. Synops. Quadr.* p. 366.

each jaw. The upper cutting teeth are thick, long, and sharp, and distant from one another about a line and a half, and the under ones are furnished with lobes *.

This bat was brought from Senegal by M. Adamson of the Royal Academy of Sciences.

* The principal characters of this bat are described in the Memoirs of the Royal Academy of Sciences, ann. 1759, under the name of the *marmotte volante*.

THE BULL-DOG BAT*.

THE muzzle of this bat is very thick, the lips long, and the nose well formed. The ears are broad and round, their edges touching each other under the front; they have a fold forward, which extends from the auditory canal to the edge of the concha, two lines distant from the place where the two ears touch each other, and there is a concavity on the internal face of the concha on each side of the fold. The crown and hind part of the head, the top and sides of the neck, the shoulders, the back, and the crupper, are of a brownish ash-colour. The middle

* CHARACTER SPECIFICUS.

VESPERTILIO MOLOSSUS. V. caudatus, cauda longe ultra membranam connectentem protensa, labio superiore pendulo. —*Linn. Syst. Nat. Gmel.* i. p. 49.

Vespertilio auriculis brevioribus, valvulis rotundatis, labiis pendulis. —*Erxleb. Mamm.* p. 151.

MULOT VOLANTE. —*Daubent. Act. Paris,* 1759, p. 387.

UNE AUTRE CHAUVE-SOURIS ETRANGERE. —*Buff. Hist. Nat. par Sonn.* xxvii. p. 144, pl. 8, fig. 2 and 3.

BULL-DOG BAT. —*Penn. Hist. Quadr.* ii. p. 311. —*Shaw's Gen. Zool.* i. p. 138.

HABITAT

in America.

of the belly is brown; the remainder of the belly, the chest, and the throat, are ash coloured, without any mixture of brown. The membrane of the wings and tail is of a blackish brown colour. The fore-legs and toes are cinereous. From the membrane there issues a portion of the tail seven lines long, which is composed of five false vertebræ. The length of the body, from the end of the muzzle to the anus, is two inches.

This animal has twenty-six teeth, two incisive, two canine, and eight grinders in the upper jaw, and, in the under jaw, two incisive, two canine, and ten grinders *.

* * * * * *

There is another bat which seems to be of the same species with the preceding, though it differs in some articles. It is smaller, being only one inch eight lines in length. The head is not so plump, and, of course, the muzzle is thinner, and the nose still better shaped. The whole upper part of the body is yellow, mixed with a tinge of cinereous. The under part is of a dirty white, inclining to a yellowish ash-colour. The membrane of the wing and tail is a mixture of brown and yellow.

* This bat is taken notice of in the Memoirs of the Royal Academy of Sciences, ann. 1759, under the name of the *Mulot volant*.

3

Plate 134

TERNAT BAT.

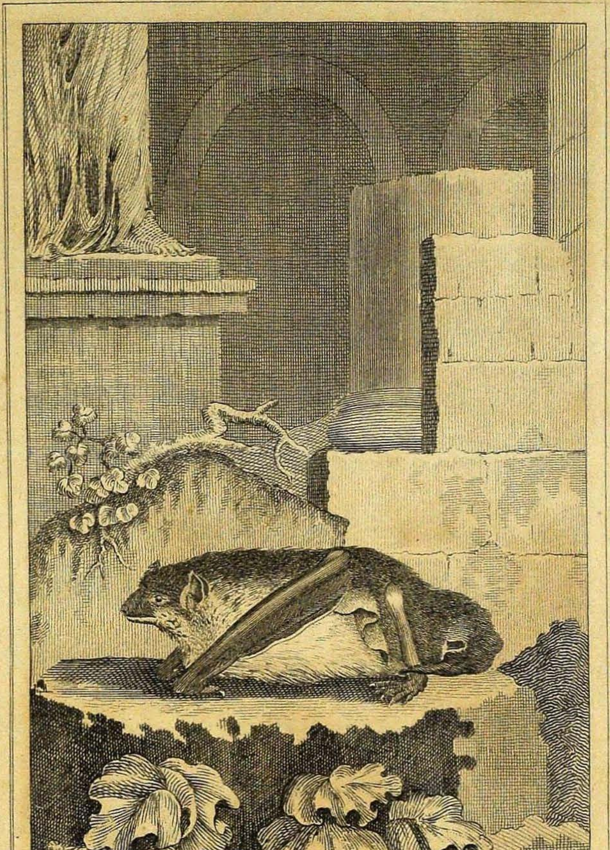
3

Plate 135

Lesser TERNAT BAT.

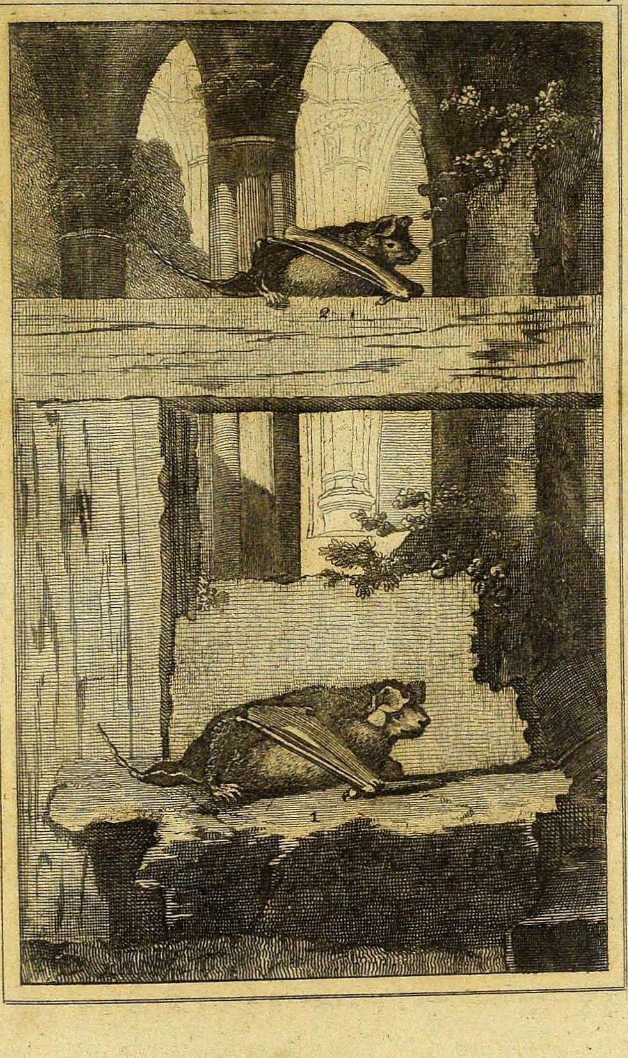
3

Plate 136



SENEGAL BAT.

Plate 137



BULL DOG BAT.

THE BEARDED BAT*.

THIS bat has a head of a very singular construction. The nose has hardly any cartilage, and the front is much sunk. The nostrils are not separated as in most animals, by a partition, but each of them is placed on the side of a small gutter, which is open above from one end to the other. The internal edge of this gutter is very small; the external is larger, and terminates in a small button. The external edges of the two gutters unite above the upper lip, and form the extremity of a large furrow, which extends from the upper lip to the front, where

* CHARACTER SPECIFICUS.

VESPERTILIO HISPIDUS. V. caudatus pilosus, naribus canaliculatis, auriculis longe angustis. — *Linn. Syst. Nat. Gmel.* i. p. 48.

Vespertilio auriculis longitudine capitis, fronte sulcata longius pilosa.—*Erxleb. Mamm.* p. 149.

COMPAGNOL VOLANT.—*Daubent. Act. Paris,* 1759, p. 388.

UNE AUTRE CHAUVE-SOURIS ETRANGERE. — *Buff. Hist. Nat. par Sonn.* xxvii. p. 145, pl. 8, fig. 4.

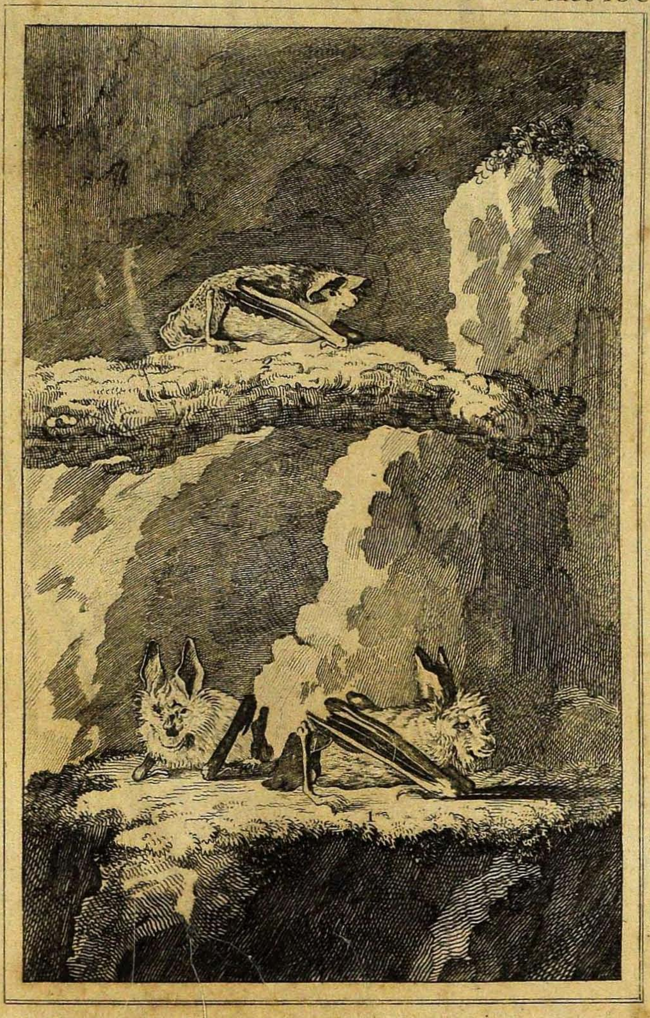
BEARDED BAT.—*Penn. Hist. Quadr.* ii. p. 313. — *Shaw's Gen. Zool.* i. p. 136.

HABITAT

circa Senegal fluvium. *W.*

there is a deep naked hole, the borders of which are covered with long hair. The ears are long and narrow. The hair of the head, except that of the top, throat, breast, and belly, is whitish, with a tincture of yellow. The hair on the top and hind part of the head, the neck, shoulders, back, and rump, is of a reddish brown. The length of the longest hairs is four lines and a half. The ears and the membrane of the wings and tail have different tinctures of blackish and reddish brown. The tail is inclosed in the membrane to the very extremity. The claws are yellowish. The length of the body is about an inch and a half, and the extent of the wings a little more than seven inches.

Plate 138



1 Bearded Bat. 2 Striped Bat.

THE STRIPED BAT.*

THE nose of this bat is very small. The ears are short, broad, and pointing forward. The hair of the front, top of the head, neck, shoulders, back, and rump, is of a whitish yellow colour; and that of the under jaw, breast, and belly, is blueish, with a tincture of yellow. The colour of the membrane of the wings and tail is a mixture of yellow and brown.

* CHARACTER SPECIFICUS.

VESPERTILIO PICTUS. V. caudatus, naso simplici, auriculis infundibuliformibus appendiculatis.—*Linn. Syst. Nat. Gmel.* i. p. 49.

Vespertilio auriculis longitudine capitis, membrana volitante nigro striata.—*Erxleb. Mamm.* p. 150.

VESPERTILIO TERNATANUS.—*Seb. Mus.* i. p. 91, t. 56, fig. 2 and 3.

UNE AUTRE CHAUVE-SOURIS ETRANGERE.—*Buff. Hist. Nat. par Sonn.* xxvii. p. 146, pl. 8, fig. 5.

STRIPED BAT.—*Penn. Hist. Quadr.* ii. p. 314.—*Shaw's Gen. Zool.* i. p. 135.

HABITAT

in Ceylona et Moluccis. *W.*

Penn. Synops. Quadr. p. 368. This bat is a native of Ceylon, where it is called Kiriwoula.—*Pallas, Miscel.* p. 49.

THE JAVELIN BAT*.

OF the various bats which were unknown, we denominated some by names derived from foreign languages, and others by appellations drawn from their most striking characters. The animal now under consideration, we have called the *javelin bat*, because it has a membrane on its

* CHARACTER SPECIFICUS.

VESPERTILIO HASTATUS. V. ecaudatus, naso foliato trifolii figuram æmulante.—*Linn. Syst. Nat. Gmel.* i. p. 47.—*Schreb.* i. p. 161, t. 46. B.

PTEROSUS HASTATUS. P. ecaudatus nigricans, naso foliato hastato.—*Erxleb. Mamm.* p. 136.

Vespertilio (Americanus) murini coloris, pedibus anticis tetradactylis, posticis pentadactylis, naso cristato.—*Briss. Quadr.* p. 228, No. 6.

LA CHAUVE-SOURIS A FER DE LANCE.—*Buff. par Sonn.* xxxiii. p. 104.

JAVELIN BAT.—*Penn. Hist. Quadr.* ii. p. 309.—*Shaw's Gen. Zool.* i. p. 142.

HABITAT

in America Australi. *W.*

* Javelin bat with large pointed ears, and an erect membrane at the end of the nose, in the form of the head of an ancient javelin, having on each side two upright processes. It has no tail; the fur is cinereous; and it is of the size of a common bat.—*Penn. Synops. Quadr.* p. 363.

nose nearly of the shape of an ancient javelin or spear. Though this character be sufficient to distinguish it from all other bats, we may add, that it has scarcely any tail; that it is nearly of the same colour and size with the common bat; but that, instead of having six cutting teeth in the under jaw, like most of the other species, it has only four. This bat, which is very common in America, does not exist in Europe.

M. Pallas, who sent us descriptions of two new bats, the figures of which we now give, informs us, that the javelin bat, should not be confounded with the bat described by Seba under the appellation of the common American bat. M. Pallas, after comparing the two, assures us, that they are very different species. Our acknowledgements are due to M. Pallas for pointing out this mistake.

He then gives a description of one of these new bats, which is a native of India. He calls it *cephalotte**, because its head is very large in proportion to its body. The neck is also more distinct, because it is not so thickly covered with hair. The following is an extract from M. Pallas's description.

"This bat, hitherto unknown to the naturalists, is found in the Molucca islands, from which two females were sent to M. Schlosser at Amsterdam. The female seems to produce but one young. This conjecture is founded

* Vespertilio cephalotes.—*Linn. Syst. Nat. Gmel.* i. p. 50.

on M. Pallas's dissection of one of these females, in which he found one fœtus only.

"This bat," continues M. Pallas, "differs from all others in the teeth, which have some resemblance to those of the mouse, or even of the hedge-hog, and appear to be rather destined for cutting fruits than for devouring prey. The canine teeth of the upper jaw are separated by two small teeth. In the under jaw, these small teeth are wanting, and the two canine teeth of the same jaw are like the cutting teeth of a mouse."

"The tail of the cephalotte bat," says M. Pallas, "is not long, and is situated under the membrane between the two thighs. The figure of the nostrils distinguishes it from every other bat. The form of the pupil likewise differs from that of every other bat. The breast is broad, and has a greater resemblance to the breast of a bird than any other species. This animal is about three inches and three quarters long, and its wings extend above a foot in length."

The second species of bats described by M. Pallas, under the denomination of *vespertilio soricinus* *, or shrew bat, has no tail, and carries a leaf or membrane on its nose. It is the smallest of those kinds which want the tail, being only about two inches long. It is equally common in the warmest regions of America, the Caribbee islands, and Surinam. Its figure seems to be

* Linn. Syst. Nat. Gmel. i. p. 47.

given by Edwards, plate cci. fig. 1. The muzzle of this bat is longer, and more slender, than in the other kinds. The tongue is remarkable both for its length and structure. The male and female hardly differ but in the organs of generation.

The bats, which are already greatly allied to the birds by their flying, their wings, and the strength of their pectoral muscles, seem to make a still nearer approach by these crests, or membranes, on their face. These redundant parts, which, at first sight, appear to be superfluous deformities, are the real characters, the visible shades, by which Nature has connected these flying quadrupeds to the birds; for most of the latter have membranes and crests round their bills and heads, which seem to be equally superfluous with those of the bats.

I shall here add a table of the number and arrangement of the teeth in the bat kind, communicated to me by M. Daubenton; from which it will appear, that the cephalotte and the shrew bat are new species discovered by M. Pallas.

NAMES.	Cutting teeth below.	Cutting teeth above.	Grinders above.	Grinders below.	Canine teeth.	Total.
Horse-shoe bat	0	4	8	10	4	26
Leaf bat	0	4	8	10	4	26
Flying rat	2	2	8	10	4	26
Flying field mouse	2	2	8	10	4	26
Flying marmot	2	6	8	8	4	28
Flying squirrel	0	4	10	10	4	28
Flying campagnol	4	6	8	8	4	30
Noctule	4	6	8	10	4	32
Serotine	4	6	8	10	4	32
Flying dog	4	4	8	12	4	32
Ternate bat	4	4	8	12	4	32
Pipistrelle	4	6	10	10	4	34
Long-eared bat	4	6	10	12	4	36
Common bat	4	6	12	12	4	38
Flying dormouse	4	6	12	12	4	38
Javelin bat	4	4	10	10	4	32
Cephalotte	2	0	6	10	4	22
Shrew bat	4	4	6	6	4	24

We have figured a great bat brought us from Cayenne, and which appears to differ sufficiently from the one described under the name of *vampire*, to be considered as forming another species, though both are found in the same country. This great Guiana bat resembles our *serotine* more than any other; but it differs greatly in size, the serotine being but two inches seven lines, while the Guiana bat is seven inches eight lines long: the muzzle is also longer, and the head is of a more elongated shape, and less hairy on the crown than that of the serotine: the ears appear likewise to be larger, being thirteen lines long, by nine across the base; insomuch that, independent of the very great difference of size, and distance of climates, this Guiana bat cannot be considered as a variety in the species of serotine; however, as it bears a much nearer resemblance to the serotine than any other bat, we have called it by the name of great Guiana serotine, in the end that voyagers may easily distinguish it from the vampire and other bats of those distant climates. Before it was dried, it measured nearly two feet between the extended wings. It is very common in the neighbourhood of the town of Cayenne, where numbers of these great bats are seen to assemble in the evening, and fly about the open places, especially over the meadows: the goat suckers mingle with these legions of bats, and sometimes these mixed bodies of birds and quadrupeds fly in such numbers, and so close, that the horizon seems covered with them.

This great serotine has chesnut coloured hairs

on the upper part of the body, the sides are of a clear yellow: the hair on the back is four lines long, but on the rest of the body it is rather shorter than that of the European serotines: it is very short, and dirty white on the belly and inside of the thighs; the nails are white and crooked: the extent of the membranes that serve them for wings, is about eighteen inches; these membranes, as well as the tail, are of a blackish colour.

We have also received from Cayenne a male bat of a species which we name *the great spear-shaped bat of Guiana,* where it is very common. It is pretty large, being four inches from the end of the nose to the anus: its extended wings measure sixteen inches four lines; a close hair covers all the body, head, and sides; the membrane of the wings is blackish, and garnished with a little shorn hair. It differs from the common bats, in not having a tail; the ears are straight, rather curved outwards, round at the ends, and without an auricle: there is a projecting spear-shaped membrane above the upper lip, with a concave edge on the lower part; in which respect it differs from the horse-shoe bat previously mentioned: this membrane is brownish, like the ears.

This bat has very soft hair, of a deep brown colour all over the body, except on the breast and belly, where it is grayish: the longest hairs are on the back, and measure three lines. There are no cutting teeth in the upper jaw; but there are two canine teeth both above and below.

Another bat (see plate cxlv.), three inches long

from the muzzle to the anus, has been sent us from Cayenne by M. de la Borde. It is common in Guiana, and generally about the size of our *noctule*. Like all the bats, it has little eyes; the end of the nose projects, the cheeks are lengthened and flat on the sides; the end of the nose is large; the distance between the two nostrils a line and a half; the length of the head, from the end of the muzzle to the occiput, ten lines. The ears, which are flat on the sides, arise from the middle of the forehead, forming several folds, extending on the cheeks and falling on the auditory canal. The auricle, which is placed before this canal, is small, with a round end. This flat form of the ears, and the projecting upper edge, give a character to this bat which distinguishes it from all the other species; but a character also peculiar to it is, its very long and straight wings: they are fifteen inches two lines in extent; each wing is seven inches long, by two inches in its greatest breadth. The bone of the arm seems attached to the body lower down than in the other bats, which balances the great length of the wings. The membrane of the wings which covers the legs and tail, is of a brown or grayish colour; the tail, wrapped in the membrane, is thirteen lines long; it is straight, and ends in a little hook.

The hair on the body is two lines and a half long; it is of a deep chesnut, or blackish brown colour; spreading on the head, lighter on the belly, and cinereous on the sides: the surface of the ears is of the same colour as the wings. The

nose, cheeks, and jaws, are covered with a very short down. The upper jaw has no cutting teeth. There is a great canine tooth, and a small pointed tooth accompanying it on each side. The lower jaw has two very small cutting teeth which touch each other. The two lower canine are pointed, and have a groove in the side, for the reception of the upper canine teeth.

JAVELIN BAT

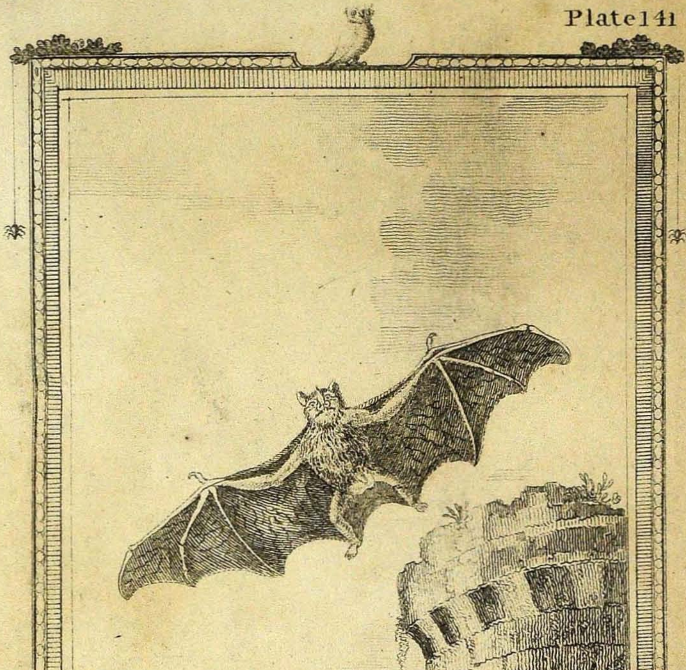
48B

Plate 140

A Bell Sculp.t

LARGE-HEADED BAT

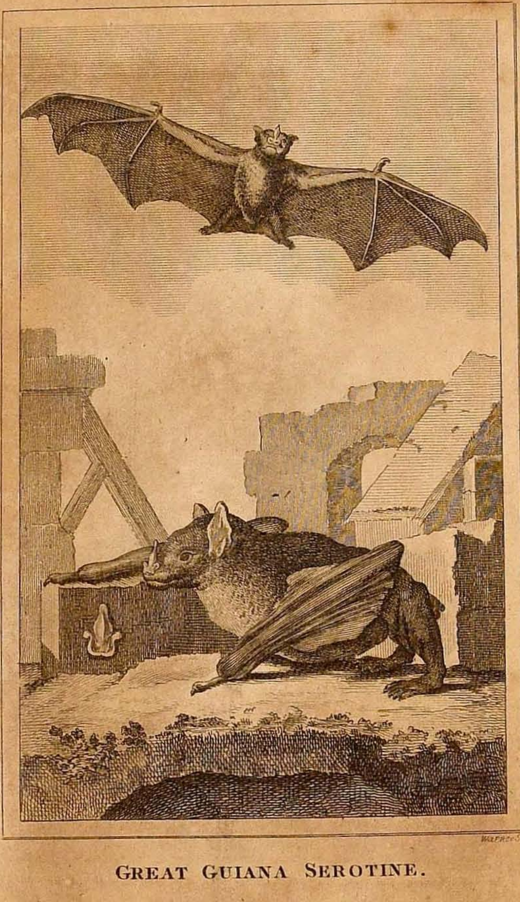
Plate 141



A Bell Sculpt

SHREW BAT

Plate 142



GREAT GUIANA SEROTINE.

Plate 143

GREAT SPEAR-SHAPED BAT *of* GUIANA.

Plate 144

GUIANA BAT.

THE FAT DORMOUSE*.

WE have three species of this animal, the fat dormouse, the garden dormouse, and the common dormouse, which, like the marmot, sleep during the winter. Of these the fat dormouse is

* MYOXUS.

CHARACTER GENERICUS.

Dentes primores duo, superiores cuneati, inferiores compressi:

Molares utrinque quatuor.

Cauda villosa, teres, versus apicem crassior.

Pedes æqualis longitudinis, anteriores tetradactyli.

CHARACTER SPECIFICUS.

Myoxus Glis. M. canus subtus albidus.—*Linn. Syst. Nat. Gmel.* i. p. 155.—*Schreb.* iv. pl. 224.

Mus cauda pilosa, corpore supra obscure cinereo, subtus exalbido.—*Briss. Quadr.* p. 160.

Mus Glis.—*Pall. Glir.* p. 88, No. 33.

Glis. — *Gesn. Quadr.* p. 619.—*Aldrov. Dig.* p. 407.—*Jonst. Quadr.* p. 164, pl. 67.—*Ray's Quadr.* p. 229.

Le Loir.—*Buff. Hist. Nat. par Sonn.* xxvi. p. 1, pl. 1.

Fat Dormouse.— *Penn. Hist. Quadr.* ii. p. 158.—*Shaw's Gen. Zool.* ii. p. 162, pl. 154.

HABITAT

in Europa australi, in silvis. Nidificat in cavis arborum.

W.

the largest, and the common dormouse the least. Several authors have confounded these three species, though they are easily distinguishable. The fat dormouse is about the size of the common squirrel, and has its tail covered with long hair: the garden dormouse is not so large as a rat, has very short hair on its tail, except near the extremity, where it is bushy: the common dormouse is not larger than the common mouse; the hair on its tail is longer than that of the garden dormouse, but shorter than that of the fat dormouse, and its tip is bushy. The garden dormouse differs from the other two, by having black spots near its eyes, and the common dormouse by having whitish hair upon its back. All the three are white or whitish on the throat and belly; but the garden dormouse is of a fine white, the fat dormouse only whitish, and the common dormouse rather yellowish than white, in all the under parts of the body.

These animals are improperly said to sleep during winter; for it is not a state of natural sleep, but a torpor or numbness of the senses and members, produced by a chillness of the blood. The internal heat of these creatures ex-

Dormouse with thin naked ears; body covered with soft ash-coloured hair; belly whitish; tail full of long hair; from nose to tail, near six inches; tail four and a half; thicker in the body than the squirrel.—*Penn. Hist. Quadr.* ii. p. 158.

In Greek, *μυαξος*, according to Gesner; Ελειος, according to the Gramarians; in Latin, *Glis*; in Italian, *Galero, Gliero, Ghiro*; in Spanish, *Liron*; in German, *Scebens-chlafer, Gruel*; in Polish, *Sozurek*; in Swiss, *Rell, Rell musc*; in French, *Le Loir, Liron, Rat-Liron, Rat-veule.*

ceeds not that of the air. When the heat of the air is ten degrees above the freezing point, their temperature is precisely the same. I have plunged the ball of a thermometer into the bodies of several living garden dormice, and found their internal heat to be always nearly equal to the temperature of the air: I have even seen the thermometer sink a degree or half a degree when applied to the heart, the temperature of the air being at that time only 11°. Now, we know, that the heat of man, and of most quadrupeds, is always more than 30°. It is not, therefore, surprising that these animals, whose heat is so small, should fall into a benumbed state, whenever their internal heat is not augmented by that of the external air; and this always happens when the thermometer exceeds not ten or eleven degrees above the freezing point. This is the true cause of the torpid state of what are called the sleeping animals; a cause which, though common to all animals that sleep during winter, has hitherto been overlooked. I have discovered it in the three animals under consideration, in the hedgehogs, and in the bats; and, though I have never had an opportunity of examining the marmot, I am persuaded that its blood, like that of the other sleepers, is cold; because it is subject to torpor during the winter.

This torpid state continues as long as the cause by which it is produced, and ceases with the cold. A few degrees of heat above ten or eleven is sufficient to re-animate them; and, if kept in a warm place during the winter, they are never

benumbed, but go about and eat and sleep from time to time, like other animals. When they feel cold, they roll themselves up in the form of a ball, in order to expose less surface to the air, and to preserve their natural warmth. It is in this form that they are found, during the winter, in hollow trees, and in holes of walls exposed to the south. There they lie, without the smallest motion, upon moss and leaves; and, though tossed about, they neither extend themselves, nor exhibit any signs of life. From this state nothing can rouse them but the application of a gentle and gradual heat; for they die when suddenly brought near a fire. Though, in this state, they have no motion, though their eyes are shut, and they seem to be deprived of every sensation; yet they feel pain when it is acute. A wound, or a burn, makes them contract, and utter a low cry, which they even repeat several times: hence their internal sensibility, as well as the action of the heart and lungs, still subsist. It is presumable, however, that these vital motions act not with equal force as when the animal is in its ordinary state. The circulation, it is probable, proceeds in the large vessels only; the respiration is slow and feeble; the secretions are inconsiderable; and no excrements are voided. There must likewise be little or no perspiration, since they pass several months without eating, which could not happen, if they lost as much of their substance by perspiration, as they do at other times, when they have an opportunity of repairing this natural waste by taking nourishment.

They still, however, lose some part; because, in long winters, they die in their holes. Perhaps, likewise, it is not the duration, but the rigour of the cold that destroys them; for they soon die when exposed to a strong frost. What induces me to think that they perish not by loss of substance, is, that in autumn they are exceedingly fat, and equally so when they revive in the spring. This quantity of fat serves for an internal nourishment to the animal, and supplies what it loses by respiration.

As cold is the only cause of their torpor, and as they fall not into this state but when the temperature of the air is below ten or eleven degrees, they frequently revive during the winter; for, in this season, there are often many days when the liquor in the thermometer stands at twelve, thirteen, fourteen, and even higher degrees; and, during fine weather of this kind, the dormice come out of their holes in quest of food, or eat what they had collected in autumn. Aristotle, and all the succeeding naturalists, have asserted, that the dormice pass the whole winter without eating; that, in this season of abstinence, they grow very fat, and that they are better nourished by sleep alone, than other animals by food *. This notion is both absurd and impossible. The dormouse, which sleeps four or five

* Tota mihi dormitur hyems, et pinguior illo
Tempore sum, quo me nil nisi somnus alit.
MART. *Epig.* lib. xiii. Ep. 59.

months, could only fatten by the air it respires. Supposing a part of this air to be converted into nourishment, an augmentation so considerable could never be the result. It would not even be sufficient to repair the continual waste occasioned by perspiration. Aristotle might be led into this error by the mild winters of Greece, where the dormice sleep not perpetually, but often revive, take plenty of food, and are, therefore, extremely fat, though in a torpid state. The truth is, they are fat at all times, and particularly in summer and autumn. Their flesh resembles that of the Guinea-pig. The Romans reckoned dormice among their most delicate dishes, and reared them in great quantities. Varro describes the method of making warrens for them; and we learn from Appicius the manner of dressing them in the high taste of his times. In this practice, whether from a disgust at these animals, because they resemble rats, or from the badness of their flesh, the Romans have not been followed by other nations. I have been informed by peasants who had eat them, that they were not better than water-rats. Besides, the fat dormouse is the only species that is eatable; the flesh of the garden dormouse is bad, and has a disagreeable flavour.

In manners and dispositions, the fat dormouse greatly resembles the squirrel. It lives in forests, climbs trees, and leaps from branch to branch, with less agility, indeed, because the squirrel has longer legs, and a body more light and meagre. They both, however, live upon the same food, namely, filberts, chesnuts, and wild fruits. The

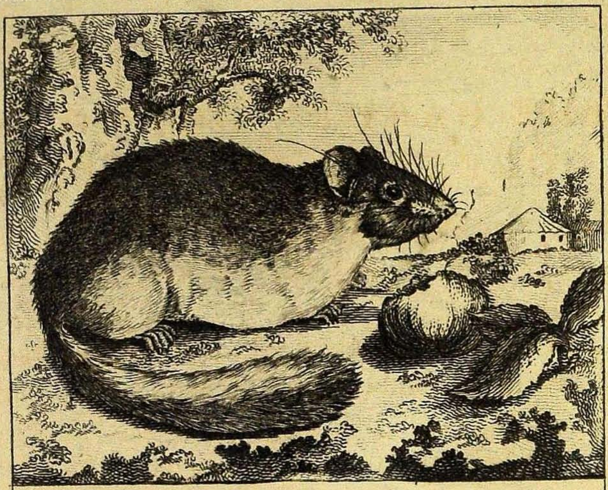
fat dormouse likewise eats small birds, which he takes in their nests. He makes not a nest in the tops of trees, like the squirrel; but he makes a bed of moss in the hollows of their trunks, or in the clefts of rocks, and always chooses a dry place. He abhors moisture, drinks little, and seldom descends to the ground. He differs still more from the squirrel in this circumstance, that the latter is easily tamed, and the former continues always wild. They couple in the end of spring, and the females bring forth in summer, the litter generally consisting of four or five. The young grow quickly; and we are assured that they live six years only. In Italy, where these animals are still eat, the natives dig pits in the woods, and strew them with straw, moss, and beech-mast. They choose dry places, under the shelter of rocks, and with a south exposure. To these the fat dormice resort in great numbers, and the people find them there in a torpid state towards the end of autumn, when they are in the best condition for eating. These small animals are bold, and defend their young to the last extremity. They bite violently with their foreteeth, which are very long, and of great strength. They neither fear the weesel nor small birds of prey. They escape from the fox, because he cannot follow them to the tops of trees. Their most formidable enemies are the martins and wild cats.

The fat dormice are not generally diffused. They appear not in very cold climates, such as those of Lapland and Sweden; at least, they

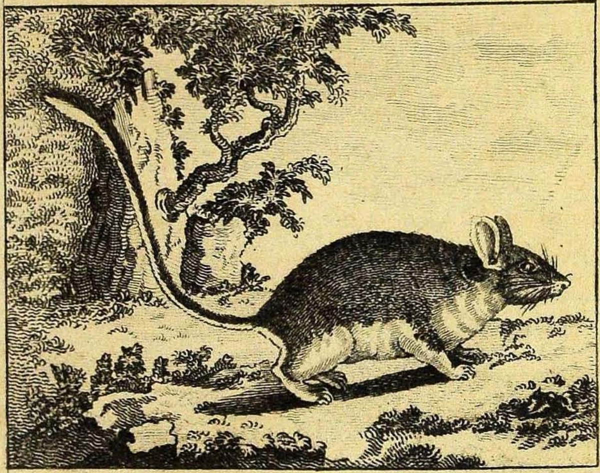
are not mentioned by the northern naturalists: the species they describe is the common dormouse, which is the least of the three *. Neither, I imagine, are they to be met with in very warm countries, because our travellers are silent on this article. There are few or none in open countries, like Britain; they require temperate climates abounding with wood. We find them in Spain, in France, in Greece, in Italy, in Germany, and in Switzerland, where they live in the forests upon the hills, and not on the tops of high mountains, like the marmots, which, though subject to torpor from cold, seem to delight in frost and snows.

* Pallas mentions the dormouse as being found in the clefts of rocks in a western aspect, near the Samara. He says that the inhabitants know the animal by the name of *Zemilianaia-rielka*, or ground squirrel. — *Voyage*, tom. i. p. 237, *traduction Française*. *W.*

6 A



FAT DORMOUSE



GARDEN DORMOUSE

THE GARDEN DORMOUSE, GREATER DORMOUSE, OR SLEEPER*.

THE fat dormouse dwells in forests, and seems to avoid the habitations of men. The garden

* CHARACTER SPECIFICUS.

Myoxus Nitela. M. rufus subtus ex albo cinereus, macula nigra circa oculos et pone auriculas. — *Linn. Syst. Nat. Gmel.* i. p. 156. — *Shreb.* iv. pl. 226.

Sciurus Quercinus. S. canus subtus albidus, macula nigra sub oculis.—*Erxleb. Mamm.* p. 432.

Mus Nitedula. — *Pall. Glir.* p. 88, No. 32.

Glis supra obscure cinereus, infra ex albo cinerascens, macula ad oculos nigra. — *Briss. Quadr.* p. 161.

Mus Avellanarum. — *Gesn. Quadr.* p. 833. — *Aldrov.* p. 439. — *Jonst. Quadr.* p. 168, pl. 66. — *Ray's Quadr.* p. 419.

Le Lerot. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 12, pl. 1.

Garden Dormouse. — *Penn. Hist. Quadr.* ii. p. 159. — *Shaw's Gen. Zool.* ii. p. 164, pl. 155.

HABITAT

in Europa australi. Nidificat in rimis murorum et cavis arboribus. *W.*

Dormouse, with the eyes surrounded with a large spot of black, reaching to the base of the ears, and another behind

dormouse, on the contrary, lives in gardens, and is sometimes found in our houses. The species is likewise more numerous, and more generally diffused: there are few gardens which are not infested with them. They nestle in holes of the walls, run upon the trees and espaliers, single out the best fruits, and devour them when they begin to be mature. They seem to prefer peaches, which, if we be desirous of preserving, we should be careful to destroy the garden dormice. They also climb with ease, pear, apricot, and plumb trees; and, when soft fruits are not to be had, they eat almonds, filberts, nuts, and even leguminous plants. Of these they carry off great quantities into their retreats which they dig in the earth, and particularly in well cultivated gardens; for in old orchards, they are often found in the hollows of trees, where they make beds of herbs, moss, and leaves. Cold benumbs or makes them sleep, and they are revived by heat. Eight or ten of them are frequently found in the same place, all benumbed, and rolled up, in the midst of their provision of nuts and filberts. They copulate in spring, and bring forth in summer. The litter consists of five or six young, which

the ears; head and whole body of a tawny colour; the throat and whole under side of the body white, tinged with yellow; the tail long; the hairs at the beginning very short, at the end bushy; length, from nose to tail, not five inches; the tail four.— *Penn. Hist. Quadr.* ii. p. 159.

In Latin, *Sorex;* in German, *Hasel Muss;* at Dantzick, *Grauwert;* in Flemish, *Slaep-rate;* in Polish, *Myszorzechowa, Koszatka;* in French, *Le Lerot.*

grow very quickly; but which, nevertheless, are not fertile till the following year. Their flesh is not eatable, like that of the fat dormouse: they have the same disagreeable odour with the domestic rat; but the fat dormouse has no bad smell. They never become so fat, and want those fatty follicles with which the intestines of the former are entirely invested. The garden dormouse is found in all the temperate climates of Europe, and even in Poland and Prussia; but he appears not to exist in Sweden and the more northerly regions.

THE GILT-TAILED DORMOUSE *.

WE have here given (after M. Allamand) the description and figure of a little animal that resembles the garden dormouse in size and in figure, and form of the tail; but as the position and shape of the ears, and the golden colour of half the tail, agrees with the common dormouse, it seems to constitute a species between the two animals. It is, says M. Allamand, to Dr. Klockner that we are indebted for the knowledge of this little dormouse: he received it from Surinam, without any account, either of the name it bears in the country, or of the place which it inhabits. Till now, it has never been described,

* CHARACTER SPECIFICUS.

MYOXUS CHRYSURUS. M. purpureo-ferrugineus, stria capitis longitudinali caudæque medietate postica luteis.—*Shaw's Gen. Zool.* ii. p. 169.

HYSTRIX CHRYSURUS. — *Schreb. Suppl.*

LE LEROT A QUEUE DOREE. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 16, pl. 2.

GILT-TAILED DORMOUSE. — *Penn. Hist. Quadr.* ii. p. 162, pl. 79.—*Shaw's Gen. Zool.* ii. p. 169, pl. 156.

HABITAT

in Surinam.

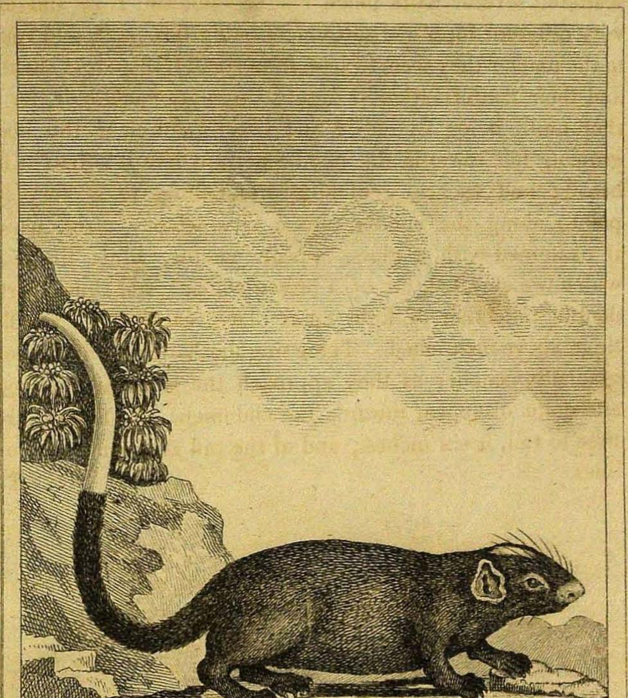
nor even known; although it is marked in a manner to attract attention. Without seeking to determine the genus to which it belongs, I have given the exact description with which M. Klockner has provided me; who, being very communicative, and always zealous for the advancement of natural history, sent me the animal itself, that I might be convinced of his accuracy. At first I was puzzled about the name that I should give it; I am not fond of compound names, that fix a title to an animal without sufficient evidence; however, I believe I ought to adopt that which M. Klockner has given it, who is in the right to describe the animal by the name which he conceives most proper: he has called it the *gilt-tailed dormouse*, without affirming that it falls into the state of torpidity which the cold occasions in the European dormice: there does not appear any reason why an inhabitant of the Torrid Zone should be subject to the same. Some similarity of figure, especially in the tail, with that of our dormice, made him prefer this name to any other *.

* The description that follows appears so much detailed, that I have preferred the abridged account by Dr. Shaw, who has omitted nothing of consequence to the history of the animal. "It is remarkable," says the doctor, "for the beauty of its colours; being of a fine purplish brown above; rather paler beneath; the tail is brown at its base, black for half its length, and the remainder of a bright gold yellow, and on the top of the head is a longitudinal stripe, of that colour. The head is large in proportion to the body; the eyes small; the ears moderately large, short, and rounded; the upper lip divided;

the front teeth white and short; those of the lower jaw being the largest: on each side the nose are long vibrissæ, or whiskers; the legs are short; the feet divided into four toes, with weak crooked claws; and in place of a thumb, a small tubercle. On the hind part of the head, and along the back, are scattered several hairs much longer than the rest, and of a very different form and substance, being flat, stiff, and rough to the touch: they seem to arise from small transparent sheaths, and their conformation is highly singular, each hair, or rather quill, being cylindric and very small near the body, growing flat towards the middle part, where it is half a line broad; and thence gradually diminishing to a very fine point; along the middle runs a channel or gutter, which, if examined with a glass, appears yellow, while the sides, which are elevated, are of a brown colour; and thus a sort of double reflection of light takes place, causing the purplish tinge above mentioned. These singular hairs or quills become gradually smaller as they approach the sides of the body, and quite disappear towards the abdomen. Its length, from nose to tail, is six inches; and of the tail six inches and nine lines.

W.

Plate 146



Warner Sc

GILT-TAILED DORMOUSE.

THE DORMOUSE, OR SLEEPER *.

THE dormouse is the least ugly of all the rats. It has brilliant eyes, and a bushy tail, which is rather fair than red. It never lives in houses, and seldom in gardens; but, like the fat dormouse, frequents the woods, and dwells in

* CHARACTER SPECIFICUS.

MYOXUS MUSCARDINUS. M. rufus, gula albicante, plantarum pollicibus muticis.— *Linn. Syst. Nat. Gmel.* i. p. 156. — *Schreb.* iv. pl. 227.

SCIURUS AVELLANARIUS. —*Erxleb. Mamm.* p. 433.

MUS AVELLANARIUS. — *Pall. Glir.* p. 89, No. 34.

Glis supra rufus, subtus albicans. — *Briss. Quadr.* p. 162.

Mus avellanarum minor. — *Ray's Quadr.* p. 220. — *Jonst. Quadr.* p. 168.— *Aldrov. Dig.* p. 439.

LA MUSCARDIN. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 23, pl. 2.

COMMON DORMOUSE. — *Penn. Hist. Quadr.* ii. p. 160. — *Edw. Av.* pl. 266. —*Shaw's Gen. Zool.* ii. p. 167, pl. 154.

HABITAT

in Europæ sepibus densis et silvis, vix in hortis. Nidum parat in cava arbore minus alta, vel in frutice prope terram e gramine, muscis, foliis. *W.*

Dormouse with round naked ears; full black eyes; body of a tawny red; throat white; size of a mouse, but plumper; tail two inches and a half long, and pretty hairy, especially towards the end. — *Penn. Hist. Quadr.* ii. p. 161.

the hollows of old trees. The species is by no means so numerous as that of the garden dormouse. The dormouse is always found alone in its hole; and there is a considerable difficulty in procuring specimens of them. It appears, however, that they are pretty frequent in Italy, and that they exist in northern climates; for Linnæus mentions them in his list of Swedish animals *. But they seem not to inhabit Britain: for Mr. Ray †, who had seen them in Italy, says, that the *little sleeping rat* of England is not red on the back, like that of Italy, and that perhaps it is a different species. In France, it is the same as in Italy, and is very well described by Aldrovandus ‡. But he tells us, that there are two species in Italy; the one is rare, and has the smell of musk; the other is common, and has no particular odour; and that, at Bologna, they are both called dormice, because of their resemblance in figure and size. We know only the second of these species; for our dormouse has no smell, either good or bad. Like the garden dormouse, it wants the fatty follicles which invest the intestines of the fat dormouse, never becomes so fat, and, though its flesh has no disagreeable odour, it is not good eating.

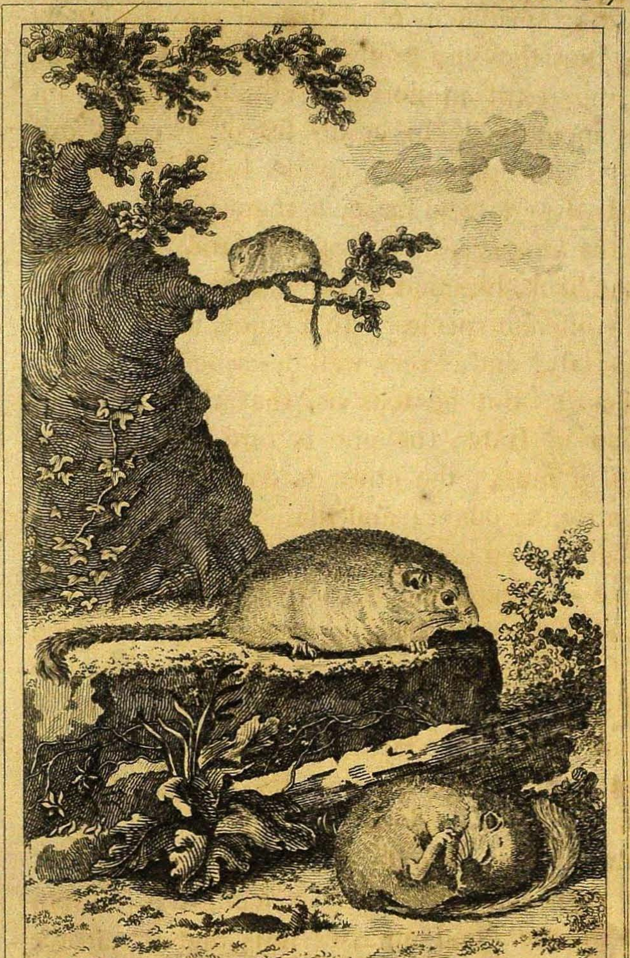
This species, like the fat and garden dormice, rolls itself up and sleeps in winter, revives in mild weather, and amasses nuts and dry fruits.

* Faun. Suec. p. 11.

† Ray, Synops. Quad. p. 220.

‡ Aldrovand. Hist. Quad. Digit. p. 440.

Plate 147



DOR MOUSE.

It makes its nest upon trees, like the common squirrel, but generally lower, between the branches of hazels, or brushwood. The nest, which consists of interwoven herbs, is about six inches diameter, and is open above only. I have been assured by many countrymen, that they have found these nests in cut woods, and in hedges; that they are surrounded with moss and leaves; and that, in each nest, there were three or four young. When they grow large, they abandon the nests, and harbour in the hollows or under the trunks of old trees, where they repose, amass provisions, and sleep during the winter.

THE ALPINE MARMOT*.

OF all modern naturalists, Gesner has brought greatest advantages to the science. To great erudition, he has joined good sense and enlarged

* ARCTOMYS.

CHARACTER GENERICUS.

Dentes primores cuneati, duo in utraque maxilla.
Molares superiores utrinque quinque, inferiores quatuor.
Claviculæ perfectæ.

CHARACTER SPECIFICUS.

ARCTOMYS MARMOTA. A. capite auriculato, corpore fusco subtus rufuscente.—*Linn. Syst. Nat. Gmel.* i. p. 141.—*Schreb.* iv. p. 722. pl. 207.

Mus capite gibbo auriculato, cauda villosa brevi, palmis tetradactylis, corpore fusco subtus rufescente.—*Pall. Glir.* p. 74.

GLIS MARMOTA. G. corpore supra fusco-cinereo, subtus cinereo flavescente.—*Erxleb. Mamm.* p. 358.

Glis (marmota alpina) pilis e fusco et flavicante mixtis vestitus.—*Briss. Quadr.* p. 156.

MUS ALPINUS.—*Gesn. Quadr.* p. 743.—*Aldrov.* p. 445.—*Jonst. Quadr.* pl. 67.—*Ray's Quadr.* p. 221.

LA MARMOTTE.—*Buff. Hist. Nat. par Sonn.* xxvi. p. 55, t. 3.

ALPINE MARMOT.—*Penn. Quadr.* ii. p. 128.—*Shaw's Gen. Zool.* ii. p. 115, pl. 143.

66

ALPINE MARMOT.

views. Aldrovandus is only the commentator of Gesner, and authors of less note have implicitly copied him. We hesitate not, therefore, to borrow facts from him with regard to the marmots, which are natives of his country, and concerning which he was better informed than us, though, like him, we have kept several of them in a state of confinement. What he says corresponds so exactly with our own observations, that we doubt not the truth of his remarks, when he retails facts of which we have no knowledge.

The marmot, when taken young, may be rendered nearly as tame as our domestic animals. He learns to seize a stick, to dance, to perform various gesticulations, and to obey the voice of his master. Like the cat, he has an antipathy against dogs. When he begins to be familiar in the house, and perceives that he is protected by his master, he attacks and bites dogs of the most

HABITAT

in alpibus Helveticis, Rhæticis, Pyrenaicis, arboribus denudatis, siccis, apricis summis. *W.*

Marmot with short round ears, hid in the fur; cheeks large; colour of the head and upper part of the body, brownish ash, mixed with tawny; legs and lower part of the body reddish; subject to vary in colour, the Polish marmot being much more red, and of a brighter hue; four toes before, five behind; tail pretty full of hair; length from nose to tail about sixteen inches, tail six; and body thick.—*Penn. Synops. Quadr.* p. 268.

In Latin, *Mus Alpinus*; in Italian, *Murmont, Marmota, Marmontana*; in German and Swiss, *Murmelthier, Murmentle, Mistbellerle*; in Polish, *Bobak, Swissez*; in French, *La Marmotte.*

formidable kind. Though not so large as a hare, he is stouter, and his strength is aided by a peculiar suppleness and dexterity. With his foreteeth, which are pretty long, he bites most cruelly. He attacks not, however, either dogs or men, unless when he is irritated. If not prevented, he gnaws furniture and stuffs, and, when confined, even pierces through wood. As his limbs are short, and his toes fashioned like those of the bear, he often sits on end, and walks with ease on his hind-legs. He carries food to his mouth with the fore-legs, and eats in the manner of a squirrel. He runs pretty quickly up hill, but slowly on a plain. He climbs trees, and mounts between the clefts of rocks, or two adjoining walls; and the Savoyards, it is said, learned from the marmots to climb for the purpose of sweeping chimneys. They eat every thing presented to them, as flesh, bread, fruit, roots, pot-herbs, May-bugs, grasshoppers, &c.; but milk and butter they prefer to every other aliment. Though less inclined to theft than the cat, they endeavour to slip into the dairy, where they drink great quantities of milk, making, like the cat, a purring noise expressive of pleasure. Besides, milk is the only liquor that is agreeable to them; for they rarely drink water; and they refuse wine.

As to figure, the marmot has some resemblance both to the bear and to the rat. It is not, however, as Perrault and some others imagined, the *arctomys* or *bear-rat* of the ancients. Its nose, lips, and form of the head, resemble those of the hare; it has the hair and claws of the bad-

ger, the teeth of the beaver, the whiskers of the cat, the eyes of the fat squirrel, and the legs of the bear. The tail is short, and the ears terminate abruptly. The hair on the back is of a reddish brown colour, more or less deep: this hair is pretty rude; but that of the belly is reddish, soft, and bushy. Its voice resembles the murmuring of a young dog, when caressed, or in a sporting humour. But, when irritated or frighted, it makes a whistling noise, so loud and piercing, that it hurts the ear. It loves cleanliness, and retires, like the cat, to void its ordure. But, like the rat, it has a very strong disagreeable smell, especially in summer. It is remarkably fat in autumn: besides a large epiploon, it has two very thick fatty follicles. All the parts of its body, however, are not equally fat. The back and reins are loaded with firm and solid fat, similar to the flesh of a cow's udder. Thus the marmot would be very good eating, if it had not always a disagreeable odour, which cannot be concealed but by very strong seasonings.

This animal, which delights in the regions of frost and snow, and which is found only on the tops of the highest mountains, is more subject than any other to be rendered torpid by cold. In the end of September, or beginning of October, he retires into his hole, from which he comes not out till the beginning of April. His retreat is made with precaution, and furnished with art. It is capacious, broader than long, and very deep, so that it can contain several marmots, without any danger of corrupting the air. With their

feet and claws, which are admirably adapted for the purpose, they dig the earth with amazing quickness, and throw it behind them. It is not a hole, or a straight or winding tube, but a species of gallery made in the form of a Y, each branch of which has an aperture, and both terminate in one, where the animal lodges*. As the whole is made on the declivity of a mountain, the innermost part alone is on a level. Both branches of the Y are inclined; one is used for depositing the excrements of the animals, and the other for their going out and coming in. The place of their abode is well lined with moss and hay, of which they make ample provision during the summer. It is even affirmed, that this labour is carried on jointly; that some cut the finest herbage, which is collected by others, and that they alternately serve as vehicles for transporting it to their dens. One, it is said, lies down on his back, allows himself to be loaded with hay, extends his limbs, and others trail him in this manner by the tail, taking care not to

* From the observations of Girtanner (*Journal de Physique*, 1789), we find that the marmots do not make their habitations exactly of this figure: he says that five or six feet from the entrance, the gallery forms two branches, of which one terminates in what is called the great cave, and the other in a blind alley. The great cave resembles an oven from three to six or seven feet in diameter, according as the family is more or less numerous: it has one outlet only, and a gallery of eighteen or twenty feet in length. The other branch is probably intended to contain the different materials that are used to block up the mouth of the burrow on the approach of winter. *W.*

overset him *. These repeated frictions are assigned as the reason why the hair is generally rubbed off from their backs. But it is more probable, that this effect is produced by their frequent digging of the earth, which is sufficient to peel the hair off their backs. Whatever may be in this, it is certain, that they dwell together, and work in common at their habitations, where they pass three fourths of their lives. Thither they retire during rain, or upon the approach of danger, and never go out but in fine weather, and even then to no great distance. One stands sentinel upon a rock, while the others sport on the grass, or are employed in cutting it to make hay. When the sentinel perceives a man, an eagle, a dog, &c., he alarms the rest by a loud whistle, and is himself the last to enter the hole.

They make no provisions for winter, as if they divined that they would then have no use for victuals. But, when they perceive the first approaches of the sleeping season, they shut up the two entrances of their habitation; and this they perform with such labour and solidity, that it is more easy to dig the earth any where else, than in the parts they have fortified. They are at this time very fat, weighing sometimes twenty pounds; and they continue to be plump for three months; but afterwards gradually decay, and are extremely emaciated at the end of winter. When discovered in their retreats, they are rolled up in the form

* This is a fable, and does not deserve the slightest credit. K.

of a ball, covered with hay; and they are carried off in so torpid a state, that they may be killed without seeming to feel pain. The fattest are chosen for eating, and the young ones for taming. Like the dormice, they are revived by a gradual heat; and those which are fed in houses, and kept warm, never become torpid, but are equally lively and active in winter as in summer. As to the sleeping of the marmot, we shall not repeat what was said under the article of the fat dormouse. The cooling of the blood is the sole cause of this phænomenon; and it has been remarked by other writers, that, in this torpid condition, the circulation, as well as all the secretions, were extremely languid, and that the blood, not being renewed by fresh accessions of chyle, has no serosity*. Whether they remain constantly torpid for seven or eight months, as is alleged by most authors, is uncertain. Their holes are deep, and they live together in numbers; a considerable heat, therefore must be preserved for some time, and they may eat the herbage they have amassed. We are even told by M. Altmann, in his treatise on the animals of Switzerland, that the hunters allow the marmots to remain unmolested for three weeks or a month; that they never dig in soft weather, or during a warm wind; that, without these precautions, the marmots awaken and dig still deeper; but that, by opening their retreats during hard frosts only, they find them so torpid as to be carried off with ease. We may, therefore,

* Phil. Trans. No. 397.

conclude, that they, in every respect, resemble the dormice; and that, if they remain longer torpid, it is because they inhabit a climate where the winter is longer *.

These animals produce but once a year, and the litter generally consists of three or four. The growth of their young is very quick; they live only nine or ten years; and the species is neither numerous nor much diffused. The Greeks were unacquainted with the marmot, or, at least, they have made no mention of it. Among the Latins, Pliny is the first who takes notice of it, under the name of *mus Alpinus*, or Alpine rat: and, indeed, though there are several species of rats in the Alps, none of them is so remarkable as the marmot, or, like it, lives in the summits of the highest mountains. The other species confine themselves to the valleys, the sides of the hills, or first mountains. Besides, the marmot never descends from the heights, but seems peculiarly attached to the chain of the Alps, and to prefer a south or east exposure to that of the north or west. He is found, however, in the Apennines, the Pyrennees, and the highest mountains of Germany. The *bobak* of Poland †, to which M.

* On the return of spring, when the marmots awake from their lethargy and leave their burrows, they assemble in a circle in a sunny situation, where they seem to enjoy the return of life and animation. They are said to have a summer retreat, which differs from their winter habitation.

W.

† Auctuarium Hist. Nat. Paloniæ, Auct. Rzaczynski, p. 327.

Brisson *, and, after him, Messrs. Arnault de Nobleville and Salerne †, have given the name of *marmot*, differs from this animal, not only in colour, but in the number of toes; for it has five toes on the fore-feet. The claw of the great toe appears beyond the skin; and we find within, the two phalanges of the fifth toe, which is entirely wanting in the marmot. Hence the *bobak*, or Polish marmot, the *monax*, or marmot of Canada, the *cavia*, or marmot of Bahama, and the *cricet*, or marmot of Strasburgh, are all different species from the Alpine marmot.

The Russian travellers have discovered an animal in Kamtschatka, which they called a *marmot*, but of which they have given us a very slight intimation only. They tell us, that its skin resembles, at a distance, the variegated plumage of a beautiful bird; that, like the squirrel, it uses its fore-feet in eating; and that it feeds on roots, berries, and cedar-nuts ‡. It is worthy of remark, that the expression *cedar-nuts* presents a false idea; for the true cedar bears cones, and other trees, called by the name of cedars, bear berries.

* Regn. Anim. p. 165.

† Hist. Nat. des Animaux.

‡ Histoire Generale des Voyages, tom. xix. p. 25; Abrégé, tom. xvii. p. 390.

74.4

Plate 149

A. Bell Sculpt.

MONAX or MARMOT of CANADA.

THE MONAX, OR MARMOT OF CANADA*.

I HAVE here given the figure of an animal called *Monax*, or *Marmot of Canada*. The design was sent me by Mr. Colinson, but without any description. This species of marmot seems to differ from the other marmots, by its having only *four* toes on the fore-feet, while the Alpine marmot and the bobak, or Polish marmot, have *five* toes both on the fore and the hind-feet.

* CHARACTER SPECIFICUS.

ARCTOMYS MONAX. A. capite auriculato, rostro cærulescente, cauda longiuscula villosa, corpore griseo. — *Linn. Syst. Nat. Gmel.* i. p. 142. — *Schreb.* iv. p. 737, pl. 208.

Mus capite gibbo auriculato, rostro cærulescente, cauda longiuscula villosa, palmas tetradactylis, corpore griseo. — *Pall. Glir.* p. 74. No. 2.

GLIS MONAX. G. corpore fusco, lateribus ventreque pallidioribus. — *Erxleb. Mamm.* p. 361.

MONAX. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 222, pl. 15. — *Edwards, Av.* ii. pl. 104.

MARYLAND MARMOT. — *Penn. Quadr.* ii. p. 130. — *Shaw's Gen. Zool.* ii. p. 117, pl. 143.

HABITAT

in America septentrionali, inque insulis Bahamensibus. Hibernat sub cavarum arborum radicibus. *W.*

There is also some difference in the form of the head, which is more thinly covered with hair. The tail of the monax is longer and less bushy than that of the common marmot; so that this Canada animal may be regarded rather as a neighbouring species than as a simple variety of the Alpine marmot. In this species, I presume, the animal called the *Whistler* by baron Hontan may be ranked *. He says, that it is found in the northern parts of Canada; that it is nearly of the size of a hare, but shorter in the body; that it is hunted for its skin only, which is much valued; but that its flesh is not good. He adds, that the Canadians call these animals *Whistlers*, because, in fine weather, they whistle at the entrance of their holes, which he has frequently heard. Our Alpine marmot makes the same kind of whistling noise †.

* Voyage du Baron de la Hontan, tom. i. p. 95.

† The monax sleeps, during winter, under the hollow roots of trees; its flesh is very good, and is said to taste like that of the pig. When disturbed, it immediately retires to its hole.

W.

THE ZIZEL, OR EARLESS MARMOT*.

SOME authors, and among others Linnæus, have doubted whether the *zisel* or *zei-*

* CHARACTER SPECIFICUS.

ARCTOMYS CITILLUS. A. auriculis nullis, cauda villosa, corpore vario. — *Linn. Syst. Nat. Gmel.* i. p. 144. — *Schreb.* iv. p. 746, pl. 211. A. B.

MUS CITILLUS. M. capite gibbo, auriculis nullis, cauda brevi villosa, corpore vario. — *Pall. Glir.* p. 76 et 119, pl. 6.

GLIS CITELLUS. G. auriculis nullis. — *Erxleb. Mamm.* p. 366.

Cuniculus (Germanicus) caudatus, auriculis nullis, cinereus. — *Briss. Quadr.* p. 147.

Mus Noricus sive Citillus. — *Gesn. Quadr.* p. 835. — *Ray's Quadr.* p. 220. — *Rzacz. Pol.* p. 235.

LE ZISEL. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 202.

EARLESS MARMOT. — *Penn. Hist. Quadr.* ii. p. 135, pl. 24.

VARIEGATED MARMOT. — *Shaw's Gen. Zool.* ii. p. 123, pl. 145.

HABITAT

in campestribus elatis, apricis; aridiusculis Russiæ et Sibiriæ australioris copiosus; copiosissimus in desertis trans Wolgam. Est quoque in Bohemia, Austria, Hungaria, Polonia.

W.

Marmot without external ears, having only a small orifice on each side of the head for the admittance of sounds. It

*sel** (*citillus*), be a different animal from the hamster (*cricetus*). They have, indeed, a great resemblance to each other, and inhabit nearly the same countries †. They differ, however, in so many characters, that I am convinced they constitute two distinct species. The zisel is smaller than the hamster. Its body is long and slender, like the weesel; but that of the hamster is thick like the rat. It has no external ears, but two auditory passages concealed under the hair. The ears of the hamsters are short; but they are large and very conspicuous. The zisel is of a uniform cinereous gray colour; but the hamster has three large white spots on each side of the breast. These differences, when joined to this circumstance, that the two animals, though they inhabit the same regions, never intermix, are sufficient to remove every doubt with regard to the diversity of their species, though they resemble one another in the shortness of the tail and legs,

has a blunt nose, a long slender body, and a very short tail. The colour is dark gray, or cinereous brown. — *Penn. Synops. Quadr.* p. 276.

* Mus Noricus quem citellum appellant, in terra cavernis habitat, ei corpus ut mustela domestica longum et tenue, cauda admodum brevis, color pilis ut cuniculorum quorumdam pilis, cinereus, sed obscurior. Sicut talpa caret auribus, sed non caret foraminibus quibus sonum ut avis recipit. Dentes habet muris dentium similes; ex hujus etiam pellibus, quanquam non sint preciosæ, vestes solent confici. — *Georg. Agricola de Animantibus subterraneis*, p. 488.

† The hamster is found in Misnia, Thuringia, and Hanover; and the zisel in Hungary, Austria, and Poland, where it is called *suset*.

in having teeth like those of the rat, and even in natural habits, such as digging retreats in the earth, laying up magazines of provisions, destroying the corn, &c. Besides, what must remove every doubt on this subject, Agricola, an exact and judicious writer, in his treatise on subterraneous animals, gives a description of both these animals, and distinguishes them so clearly, that it is impossible to confound them *. Hence we may conclude, that the hamster and zisel are very different species, and perhaps as remote from each other as the weesel from the rat †.

* Istius (viverræ scilicet) ferocitatis est etiam agri vastator et cereris hostis *hamster*, quem quidam *cricetum* nominant. — Existit iracundus et mordax. — In terræ cavernis habitat non aliter atque cuniculus, sed angustis, et id circo pellis qua parte utrinque coxam tegit a pilis est nuda. Major paulo quam domestica mustela existit; pedes habet admodem breves: pilis in dorso color est fere leporis, in ventre niger, in lateribus rutilus; sed utrinque latus maculis albus tribus numero distinguitur. Suprema capitis pars, ut etiam cervix, eundem quem dorsum habet colorem; tempora rutila sunt; guttur est candidum. Caudæ quæ ad tres digitos transversos longa ut similiter leporis color. Pili autem sic inhærent cuti ut ex ea difficulter evelli possint. Ac cutis quidem a carne facilius avellitur quam pili ex cute radicitus extrahantur, atque ob hanc causam et varietatem pelles ejus sunt preiosæ. *Georg. Agricol. de Anim. subt. p.* 490.——This description of the hamster, when compared with that of the zisel given by the same author, and which the reader will find in a note on the preceding page, is sufficient to demonstrate that these animals are very different from one another.

† The zisel, according to Pallas, is the same animal as the souslik: it frequents both woods and marshy places, and is not uncommon by road sides: it is a solitary creature, living retired in its hole, without even the company of a female, except in the breeding season. *W.*

THE SOUSLIK, OR CASAN MARMOT*.

IN Casan and the provinces watered by the Volga, as far as Austria, there is a small animal called *souslik* in the Russian language, which furnishes a beautiful fur. In figure and shortness of tail, it has a great resemblance to the short-tailed field-mouse. But it is distinguished from the mouse or rat kind by its fur, which is every where interspersed with small spots of a bright and shining white. These spots exceed not a line in diameter, and are placed at the distance of two or three lines from each other. They are more conspicuous and better defined upon the loins than on the shoulders and head. Mr. Pennant, a well known and very able naturalist,

* LE SOUSLIK. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 197, pl. 14.

Casan marmot, with short round ears; smooth hair, of a yellowish brown colour, marked with faint round spots of white; above and below the eye, a bar of white; face, breast, belly, and legs, of a pale yellow; four toes before, five behind; tail half the length of the body, covered with short hair of the colour of the body; size of a large rat. — *Penn. Synops. Quadr.* p. 273.

80

A Bell Sculp^t

SOUSLIK.

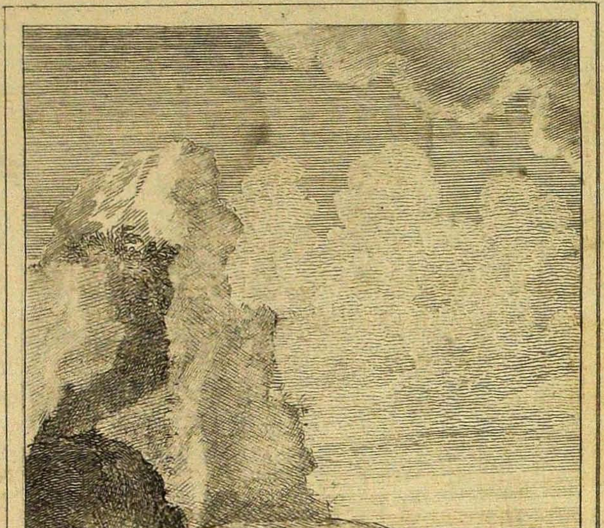
favoured me with one of these sousliks, which had been transmitted to him from Austria, as an animal unknown to the naturalists. I recognised it to be the same animal with that of which I had a skin in my possession, and of which M. Sanchez* sent me the following notice: "Great numbers of the rats called sousliks are taken in the barks loaded with salt in the river Kama, which descend from Solikamski, where there are salt-pits, and fall into the Volga, above the town of Casan, at the confluence of the Teluschin. The Volga, from Simbuski to Somtof, is covered with these salt barks; and it is in the lands adjacent to these rivers, as well as in the barks, where the sousliks are taken. They have obtained the denomination of *souslik*, which signifies *nice-tasted*, because they are extremely fond of salt."

We have given a figure of this animal, which is not in the original work. Prince Galitzin, at the desire of M. de Buffon, was so obliging as to send eight sousliks, with the necessary precautions for preserving them alive, till they should arrive in France. These eight animals arrived in Petersburgh, after a long journey from Siberia. But, notwithstanding all the attention paid to them, they died in passing from Petersburgh to France. The instructions from Siberia were, to feed them only with grain or hempseed; to give them as much air as possible; to put a considerable quantity of sand in their cage,

* Formerly physician to the court of Russia.

because, in their natural state, they burrow in light soils.

These animals generally dwell in the deserts, and dig holes in the declivities of mountains, provided the earth be blackish. Their holes are not of equal depths, and are seven or eight feet long, never straight, but winding, and have from two to five entries, the distances of which are unequal, being from two to seven feet asunder. In these holes they make different apartments, and amass in them their winter provisions during the summer. In the cultivated fields, they collect ears of corn, pease, lint, and hemp-seeds, and place them separately in different departments of their holes. In uncultivated lands, they collect the seeds of various herbs. During summer, they féed upon grains, herbs, roots, and young mice; for, when the mice are large, the souslik is unable to kill them. Beside their magazines of provisions, these animals dig separate holes some feet distant from the former, in which they repose. They throw all their ordure out of their retreats. The females bring forth from two to five young at a litter, which are blind and naked, and begin not to see till after the hair appears. The time of gestation is not exactly known.



BOBAK.

THE BOBAK, AND OTHER MARMOTS*.

THE hamster has been called the *Strasburgh marmot*, and the bobak the *Polish marmot*. But it is equally certain that the hamster is not a marmot, as it is probable that the bobak does belong to that species; for the bobak differs from the Alpine marmot only in the colour of his hair, which, instead of brown, is a pale yellow. He has

* CHARACTER SPECIFICUS.

ARCTOMYS BOBAC. A. capite auriculato, cauda villosa, palmarum ungue pollicari, corpore griseo subtus luteo.—*Linn. Syst. Nat. Gmel.* i. p. 143.—*Schreb.* iv. p. 738, pl. 209.

Mus (Arctomys) capite gibbo auriculato, cauda brevi villosa, palmarum ungue pollicari, corpore griseo subtus luteo.—*Pall. Glir.* p. 75, pl. 5.

Glis (marmota polonica) flavicans, capite rufescente.—*Bri[illegible]r.* p. 165.

Le [illegible]ak.—*Buff. Hist. Nat. par Sonn.* xxxii. p. 219, pl. 14.

BOBAK MARMOT.—*Penn. Hist. Quadr.* ii. p. 131.—*Shaw's Gen. Zool.* ii. p. 120. pl. 144.

HABITAT

in siccis et apricis montium planitiebus a Borysthenis ripis per mediam et temperatiorem Asiæ partem ad Sinam et Kamtschatcam usque; cavernas quoque profundissimas sibi fodiens, in quibus 20 — 24, habitant. *W.*

also a thumb, or rather a claw on the fore-feet; while the marmot has only four toes and no thumb. In every other article the resemblance is perfect; from which it is to be presumed, that these two animals are not distinct species. The same observation applies to the *monax* or *marmot of Canada*, which by some travellers has been called the *whistler*. He seems to differ from the marmot only by the tail, which is longer, and more bushy Hence the monax of Canada, the bobak of Poland, and the Alpine marmot, appear to be the same animal, which, from the influence of different climates, have undergone the varieties formerly mentioned. As this species prefers the coldest and most mountainous regions, and as it is found in Poland, Russia, and other parts of the north of Europe, it is not surprising that it should likewise be found in Canada, where it is only smaller *. Neither is this circumstance peculiar to the marmot; for all the animals common to both continents are smaller in the New than in the Old World.

The Siberian animal, which the Russians call *Jevraschka*, is a species of marmot still smaller than the Canadian monax. It has a round head and a blunt nose. It has no external ears, and the auditory passages can only be discovered by removing the hair. The length of the body, including the head, exceeds not a foot; and the

* The Alpine and Polish marmots are a foot and a half long from the extremity of the muzzle to the origin of the tail; but the monax, or Canadian marmot, exceeds not fourteen or fifteen inches in length.

tail, which is round near the body, then flat, and truncated at the extremity, is but three inches long. The body of this animal is pretty thick, the hair is yellow, mixed with gray, and that on the end of the tail is almost black. The legs are short, those before being somewhat longer than those behind. The hind-feet have five toes and five black claws, which are a little crooked; and the fore-feet have only four. When these animals are irritated, or attempted to be seized, they bite violently, and set up a sharp cry like the marmot. When they eat, they sit on their buttocks, and carry the victuals to their mouths with the fore-paws. They come in season in spring, and bring forth in summer. The litter is generally five or six. They dig holes in the earth, where they pass the winter, and where the female brings forth and suckles her young. Though they have a great resemblance to the marmot, yet they appear to be of a different species; for, in the same parts of Siberia, there are genuine Polish or Alpine marmots, which the natives call *surok* *; and it has never been remarked that the two kinds mix, or produce an intermediate race †.

* Voyage de Gmelin, tom. ii. p. 444.—In Tartary, says Rubruquis, there are plenty of marmots, which are called *sogur*. In winter they assemble together, to the number of twenty or thirty, in a large hole, where they sleep during six months.—*Voyages en Tartarie*, p. 25.

† As the notice which Buffon has taken of the Bobak is very slight, I shall add an account of its manners from Pennant's Quadrupeds.

"They burrow extremely deep and obliquely, to the depth

of two, three, or four yards: they form numbers of galleries with one common entrance from the surface; each gallery ends in the nest of the inhabitant. Sometimes the burrows consist of only one passage. They are found in great abundance about the sepulchral tumuli, as they find they can penetrate with great facility in the soft dry earth; but they are very common in the rocky strata; and in the mineral part of the *Uralian* chain, often direct the miners to the veins of copper, by the fragments which appear at the mouth of their holes, flung out in the course of their labours. In very hard and rocky places, from twenty to forty of these animals join together to facilitate the work, and live in society, each with its nest at the end of its respective gallery; but the fewest galleries are found in the softest ground, and very frequently only a single one. In each nest they collect, especially towards autumn, the finest of hay, and in such plenty, that sufficient is found in one nest for a night's food for a horse.

"During the middle and sunny part of the day they sport about the entrance of their holes, but seldom go far from them; on the sight of man they retire with a slow pace, and sit upright near the mouth, and give a frequent whistle, listening at the approach. In places where they live in large families, they always place a sentinel to give notice of any danger during the time the rest are feeding. They are very fond of oleraceous plants: in a state of confinement eat cabbage and bread very greedily, and drink milk with great eagerness; but refuse water, and seem never affected with thirst: they are mild and good natured; never quarrel or fight about their food in a wild state, and when confined, and placed with others, caught in distant parts, and strangers to them, grow instantly familiar with them; then they soon become tame, even when taken in full age: but the young immediately become familiar.

"The number produced at a birth is not certainly known, probably at times eight; the females being furnished with that number of teats: they breed early, for in June the young are observed to be of half the size of the old. They lie torpid during winter, except those which are kept tame in the stove-warmed rooms of the country; and even then, finding a defect of that warmth which the snug nest of their subterraneous retreat would afford, in cold nights creep for shelter into the

very beds of the inhabitants. In that state they will not absolutely refuse food, but eat very little, and that with a seeming disgust; Nature allotting for them, in the wild state, a long sleep and cessation from food, the result of plenitude previous to its commencement. They sometimes escape from confinement, find a retreat, and get their winter's sleep, and return to their master in the spring, but lose much of their gentle manners.

They grow very fat: the fat is used for softening of leather: the skins are used by the Koreki, people of Jakutks, and the Russians, for clothing. The Calmucks take them in small nets with large meshes, placed before their holes. The inhabitants of Ukraine catch them in May or June, by pouring water into the holes, which forces them into the nets. In South Russia they are destroyed by means of a log of wood with a weight at top; the end directed into a wooden box placed at the mouth of the hole, which falls as soon as the animal comes out, and oppresses it by the weight. Their flesh tastes like that of a hare, but is rank. The Calmucks are very fond of the fat ones, and even esteem them medicinally: on the contrary, the Mahometan Tartars not only abstain from their flesh, but even give them protection; so that near the hordes they are extremely numerous: these Tartars esteem a warren of bobaks near them to be very fortunate, and think it a sin to kill one of them, a swallow, or a dove. In Chinese Tartary they are the propagators of rhubarb, which grows among their burrows; the manure which they leave about the roots contributes to its increase; and the loose soil they fling up, proves a bed for the ripe seed; which, if scattered among the long grass, perishes without ever being able to reach the ground." — *Penn. Hist. Quadr.* ii. p. 132. *W.*

THE MARMOT OF THE CAPE OF GOOD HOPE *.

WE owe the first notices of this animal to M. Allamand, a learned naturalist and professor at

* HYRAX.

CHARACTER GENERICUS.

Dentes primores superiores duo, lati, distantes. Inferiores quatuor, contigui, lato-plani, bis crenati.

Molares magni, ubique quatuor.

Palmæ digitis quatuor.

Plantæ digitis tribus.

Cauda nulla.

Claviculæ nullæ.

CHARACTER SPECIFICUS.

HYRAX CAPENSIS. H. palmarum unguibus planis, plantarum unico subulato. — *Linn. Syst. Nat. Gmel.* i. p. 166. — *Schreb.* iv. pl. 240.

CAVIA CAPENSIS. C. ecaudata, dentibus primoribus infra quatuor. — *Erxleb Mamm.* p. 352.

CAVIA CAPENSIS. — *Pall. Miscel. Zool.* p. 34, pl. 3 and 4, fig. 5 — 13. — *Spicel, Zool. Fasc.* ii. p. 16, pl. 2 and 3.

LE KLIPDAS. — *Buff. Hist. Nat. par Sonn.* xxxii. p. 226.

MARMOTTE DU CAP DE BONNE ESPERANCE. — *Buff. Hist. Nat. Suppl.* tom. vii. p. 308, pl. 79 (Klipdas).

CAPE CAVY. — *Penn. Hist. Quadr.* ii. p. 96.

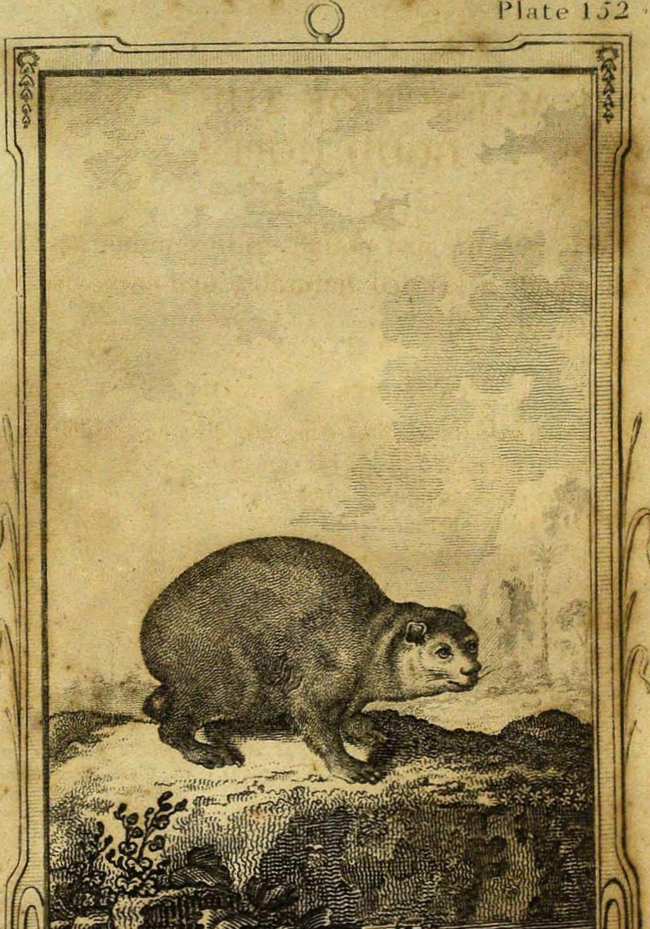
CAPE HYRAX. — *Shaw's Gen. Zool.* ii. p. 217, pl. 164.

HABITAT

ad caput Bonæ Spei, vulgaris in locis rupestribus, fodiens.

In deference to the name given this animal by the count de Buffon, I have placed it at the end of the marmots, but it

Plate 152



A. Bell sculp.

MARMOT of the CAPE of GOOD HOPE.

Plate 152

MARMOT *of the* CAPE *of* GOOD HOPE,
or KLIPDAS.

Leyden. M. Pallas has described it under the name of *Cavia Capensis*, and M. Vosmaer under that of the *Bastard African Marmot*. Both have given a figure of it from the same plate, of which M. Allamand has sent me a copy. In writing on this subject to M. Daubenton, he remarks:

"I send you the figure of a species of cabiai (I know no other name to give it), which I received from the Cape of Good Hope. It is not so well drawn as I could wish; but, as I have the animal stuffed in my cabinet, if you are inclined, I shall transmit it to you by the first opportunity."

We accepted not this obliging offer of M. Allamand, because we were soon after informed, that one or two of these animals had arrived in Holland alive, and hoped that some naturalist would furnish us with an exact description. Both M. Pallas and M. Vosmaer have accordingly described this animal, and I shall here give extracts from their remarks:

"This animal," says M. Vosmaer," is known at the Cape of Good Hope under the name of the *rock badger*, probably because it lives among rocks, and under the earth, like the badger; to which, however, it has no resemblance. It has a greater affinity to the marmot, and yet it

certainly is not a species of Arctomys, since it neither resembles the animals of that genus in its manners nor appearance; indeed its natural history has not, till lately, been well understood. It is now separated from the genus Cavia, to which it is very nearly allied, from the circumstance of having four teeth in the lower jaw instead of two. *W.*

differs considerably from that animal. . . . . . .
Kolbe is the first who mentions this animal, and he says, that it resembles the marmot more than the badger."

We shall adopt the name of the *marmot of the Cape*, in preference to that of the cavia, because it differs from the cavia or cabiai in many respects: 1. In the climate, the cavia being an animal of South America, while the other is found in Africa only. 2. Because cavia is a Brasilian word, and ought not to be transported into Africa, since it belongs to the true cavia, and to the cavia cobaia, or Guinea-pig. Lastly, because the cabiai inhabits only the margins of waters, and has membranes between its toes; but the marmot of the Cape lives among rocks, and in dry grounds, which it can dig with its claws.

"The first animal of this species," says M. Vosmaer, "that appeared in Europe, was sent by M. Tulbagh to the prince of Orange, and its skin is still preserved in his cabinet. The colour of the first differed greatly from that of another which arrived afterwards: it was very young and very small. That which I am about to describe was a male, and was sent me by M. Bergmeyer of Amsterdam. . . . . . The life of this animal, according to my information, is very melancholy; for it slept much during the voyage. Its motion is slow, and performed by leaps. But, perhaps, in a natural state, it is equally active as the rabbit. Its cries were frequent, but short, sharp, and piercing."

I shall observe, by the way, that this character brings the animal still closer to the marmot; for the Alpine marmots often make a sharp whistling noise.

"In Holland," continues M. Vosmaer, "they feed this marmot with bread and different kinds of pot-herbs. It is probable that this animal brings forth often, and in great numbers. The form of their feet indicates that they are destined for digging the earth. The present marmot having died at Amsterdam, I gave it for dissection to M. Pallas.

"In stature it resembles the common rabbit, but it is thicker and more collected. The belly is peculiarly gross; the eyes are beautiful, and of an ordinary size. The eyebrows, both above and below, are garnished with some short black hairs, above which there are five or six hairs of the same colour, but long, that turn back toward the head. It has similar whiskers on the upper lip, about the middle of the muzzle.

"The nose is black, naked, and divided by a fine suture, which descends to the lip. The nostrils resemble a cord broken through the middle. Under the muzzle, on the throat and cheeks, are some long, rude, black hairs; and hairs of the same kind are scattered over the whole body. In the palate there are eight deep furrows: the tongue is very thick, tolerably long, garnished with small papillæ, and oval at the point. In the upper jaw, there are two strong teeth which protrude over the under jaw, and are considerably distant from each other, having a kind of tri-

angular appearance. In the under jaw, it has four close cutting teeth, which are very broad, long, and flat. The grinders, of which it has four on each side, are also large; and a fifth of a smaller size may be added to the number. Its fore-legs are short, and half covered with the skin of the body. The feet are black and naked. Those before have four toes; the middle one is longest, and the exterior one is shorter, and seems to adhere to the third. The toes are armed with round short claws, which adhere to the skin like the human nails. There are three toes on the hind-feet; the middle one only is furnished with a crooked claw, and the exterior toe is shorter than the others. The animal leaps on its hind-legs, like the rabbit. It has not the smallest vestige of a tail. The colour of the hair is gray, or a yellowish brown, nearly like that of a wild rabbit; but it is deeper upon the head and back; and the breast and belly are whitish. There is also a whitish belt upon the neck and near the shoulders. This belt forms not a collar, but terminates at the top of the fore-legs. In general, the hair is soft and woolly."

We have not given the description of the internal parts of this animal; it is to be found in the *Spicilegia Zoologica* of M. Pallas. That able naturalist has done it very carefully, and it must be copied verbatim to preserve all his observations.

M. le comte de Mellin, whom we have already had occasion to quote with praise, sent me the engraving after the drawing which he made from

the living animal, and he has had the goodness to add several interesting observations on its natural habits. The following is an extract of the letter which he wrote me on this subject.

"Monsieur le comte was right in saying that the animal, the history of which he has given under the name of klipdas, is not a marmot; it has no resemblance in its manners to the marmot. I received a female from the Cape of Good Hope, which still lives, and which I have given to my sister the countess of Borke, who has had it these four years. I painted it from nature, and have the honour to send you an engraving executed from the picture, which represents this little animal to the life. The disposition of these little animals is not so dull as M. Vosmaer pretends, on the contrary, it is of a gay and active nature; this depends on the manner in which it is managed. During the first weeks that I had it, I always fastened it to its little lodge with a string, and it passed the greatest part of the days and nights asleep, which better enabled it to support the ennui of slavery: but since I have suffered it to run at liberty about the rooms, it is quite changed; it is not only very tame, but even susceptible of attachment. It loves to be on the knees of its mistress: it distinguishes her from others, to such a degree, that when it is shut up in a room and hears her coming, it approaches the door, listens; and if she returns without entering, it goes back slowly and sorrowfully. When she calls, it answers by a slight and not disagreeable cry, and comes immediately to the

person who bids it. It leaps very lightly and with great precision: it is chilly, and prefers sleeping on the top of the stove. It does not climb, but leaps as lightly as a cat, without ever falling back. It loves to be by the fire-side, and as the stove in the room is what we call a *windofen*, which is heated by a kind of chimney contrived in the stove, and which is closed with an iron door; it happened that he slid in while the wood was burning, and as we had shut the door upon him, not knowing that he was there, he endured a very violent heat for some minutes, till he put his nose to the iron door made in the great door, which we had left open to admit the air, on which he immediately came out; although the hair was burnt off both his sides, this accident did not make him more careful, and he still constantly frequented the fire-place. This animal is extremely clean, so much so that we have accustomed him to use a pot to deposit his excrements and water in. We observe that to void them he chooses a commodious place and particular attitude; for then he raises himself on his hind-feet, and supports them against a wall, or something firm that will not run from under him, and he rests his fore-feet on a stick or something raised, licking his mouth with his tongue all the time the operation lasts. It is said that he discharges with difficulty, and to encourage the inclination which he has for cleanliness, we have accommodated him with a kind of close-stool, which he always uses.

"He feeds on herbs, fruits, and potatoes, which he is very fond of raw or boiled, and he

even eats smoaked beef, but that only, and never raw, nor other meat: it was apparently during his sea voyage that he became acquainted with this food, which ought however to be often changed, for he soon leaves it, and loses his appetite when it is given him for several days together. Then he will pass a whole day without eating, but on the next he makes up for his lost time. He eats the moss and bark of the oak, and will cleverly slip to the bottom of the wood-chest to carry off the logs. He does not drink in general, and it is only when he has eaten dried beef that he drinks frequently. He rubs himself in the sand, like the fowls, to get rid of the vermin that plague him; and it is not by wallowing like dogs, and foxes, but in a manner totally different from any other quadruped, and exactly like the pheasant or the partridge. He is very active all the year round, and appears to me too wakeful to suppose that he passes part of the winter in a state of torpor, like the marmot or the dormouse. I cannot see that he is able to burrow like the marmots or the badgers, not having crooked nails to the toes, nor those strong enough for such rough work. He can only glide into the fissures of rocks, to establish his dwelling and escape from the birds of prey, which he is much afraid of; at least every crow that flies, when he is sitting in the window (his favourite place), alarms him; he flies at once, and shortly hides himself in his lodge, which he does not leave for a considerable time after, until he thinks the danger over. He does not bite violently, and although

he wants not the inclination when irritated, he can hardly defend himself with his teeth even against the little spaniel belonging to his mistress; who, jealous of the favours we heap upon him, sometimes picks a quarrel. Probably in a natural state he finds his safety only in flight, and the celerity of his leaps; very useful talents for this little animal, which, according to the report of voyagers, inhabits the rocks to the south of Africa. Although he becomes very fat when tied up or confined, he does not increase more than any other well fed animal when he has full liberty to range and take exercise*."

* The present figure, taken from the count's seventh supplemental volume, is a much better representation of the animal than the former one; which was copied from a bad drawing. *W.*

A

Plate 153

BEAR.

6B

Plate 154

WHITE BEAR.

THE BEAR*.

THERE is no animal so generally known as the bear, concerning which the writers of natural history have differed so much. Their uncertain-

* URSUS.

CHARACTER GENERICUS.

Dentes primores superiores sex, intus excavati alterni: inferiores sex; laterales duo longiores, lobati; secundarii basi interiores.

Laniarii solitarii.

Molares quinque seu sex, primo laniariis approximato.

Lingua lævis.

Nasus prominens.

Membrana nictitans.

CHARACTER SPECIFICUS.

Ursus Arctos. U. fusco nigricans, cauda abrupta.—*Linn. Syst. Nat. Gmel.* i. p. 100.—*Erxleb. Mamm.* p. 156.

Ursus niger, cauda unicolore.—*Briss. Quadr.* p. 184.

Ursus.—*Gesn. Quadr.* p. 14.—*Aldrov.* p. 117.—*Jonst. Quadr.* p. 123, pl. 55.—*Ray's Quadr.* p. 171.

L'Ours. *Buff. Hist. Nat. par Sonn.* xxvi. p. 48, pl. 4.

Brown Bear.—*Penn. Hist. Quadr.* ii. p. 1.—*Arctic Zool.* i. No. 20.—*Bew. Quadr.* p. 261.

Common Bear.—*Shaw's Gen. Zool.* i. p. 450, pl. 102.

Variat colore.

α. *Niger*, minor.

β. *Fuscus* aut ferrugineo—fuscus. Hic forte specie differt a præcedente α, uti Buffonio videtur.

ties, and even contradictions, with regard to the nature and manners of this animal, seem to have proceeded from their not distinguishing properly the different species; and, of course, they sometimes ascribe to one the properties of another. In the first place, the land-bear must be distinguished from the sea-bear, the latter being commonly called the *white bear*, or *bear of the frozen sea*. These two animals are very different, both in the form of their bodies, and in their natural dispositions. The land-bears must again be distinguished into the *brown* and the *black* *; because, having neither the same inclinations, nor the same natural appetites, they cannot be regarded as varieties only of one and the same species. Besides, some land-bears are white, and,

γ. *Albus*, vel niger admixtis pilis albis.
In Persia ex albo flavescit, minor

HABITAT

solitarius in uliginosis sylvaticis regionum borealium Europæ; Asiæ atque Americæ (ubi sola varietas α), nec non in alpinis regionibus Helvetiæ, Galliæ (præcipue varietas β), Persiæ, Japoniæ, Ceylonæ, reguique Peruani.

W.

The bear has six cutting teeth and two canine in each jaw; five toes before and five behind. In walking, he rests on the hind-feet, as far as the heel.—*Penn. Synops. Quadr.* p. 190.

In Greek, Αρκτος; in Latin, *Ursus*; in Italian, *Orso*; in Spanish, *Osso*; in German, *Baer*; in Swedish, *Bioern*; in Polish, *Wewer*, *Niedzwiedz*; in French, *L'Ours*.

* Under the denomination of the *brown bears*, I comprehend those which are brown, yellow, red, or reddish; and under *black*, all the shades of that colour.

though resembling in colour the sea-bear, they differ from it, in every other particular, as much as the other bears. These white land-bears are found in Great Tartary *, in Muscovy, in Lithuania, and in other northern regions. They are not rendered white during winter by the rigour of the climate, like the ermines, or the hares, but are brought forth white, and remain so in all seasons. They ought, therefore, to be considered as a fourth species, if we did not also find bears with their hair consisting of a mixture of brown and white, which indicates an intermediate race between the white land-bear and the brown or black bear; consequently the white land-bear is only a variety of one or other of these species.

The brown bear is very common in the Alps; but the black bear is extremely rare. The latter, on the contrary, abounds in the forests of the northern regions of Europe and America. The brown bear is furious and carnivorous; but the black bear is only wild, and uniformly refuses to eat flesh. Of this we cannot give a more distinct and recent testimony than that of M. du Pratz, in his History of Louisiana †.

"The black bear," says he, "appears in Louisiana during the winter; because the snows which cover the northern countries prevent him from finding sufficient nourishment. He lives upon fruits, acorns, and roots; but he is peculiarly

* See Relation de la Grande Tartarie, p. 8.

† Tom. ii. p. 77.

fond of honey and milk; and, when he meets with these articles, he will rather die than quit them. Notwithstanding the common prejudice, I affirm, and in this assertion I am supported by all the inhabitants of this province, and of the neighbouring countries, that he is not a carnivorous animal. Though numerous, and often pressed by extreme hunger, they never devour men, nor eat even butchers'-meat, when they fall in with it. During the time I lived among the Natches, a severe winter in the northern regions made the bears descend in vast quantities. They were so numerous, that they starved each other, and were very meagre. Famine made them come out of the woods which border on the river. We saw them, during the night, run into houses and court-yards, which were not properly shut, where they found meat exposed; but they never touched it, and eat only what grains they could pick up. On an occasion so pressing, they must infallibly have discovered their carnivorous disposition, if they had an appetite of this nature. They never kill animals to devour them; and, if they were carnivorous, they would not abandon countries covered with snow, where they could find men and animals at will, in order to search for fruits and roots, a species of food rejected by the carnivorous tribes." M. du Pratz adds, in a note, that, since writing the above article, he had learned with certainty, that, in the mountains of Savoy, there are two kinds of bears, the one black, like those of Louisiana, and not carnivorous; the other red, and equally carnivorous

as the wolves. The baron de Hontan remarks *, that the bears of Canada are very black, but by no means dangerous; and that they never attack men, unless when shot at and wounded. He farther observes †, that the reddish bears are extremely mischievous, and boldly attack the hunters; but that the black bears uniformly fly from men.

We have seen at the menagery of Chantilly an American bear of a fine black colour, and having soft, straight, long hair. We remarked other differences in the figure of this American bear, compared with that of Europe, as in the head, which is somewhat longer, because the muzzle is not so flat as that of the European bear.

In the relation of M. de Bertram's expedition, we have a notice of an American bear, killed near St. John's river, in East Florida, in the following terms:

"This bear," according to the relation, "weighed only 400 pounds, though the length of its body was seven feet, from the extremity of the nose to the tail. The fore-feet were only five inches broad, and the thickness of the fat was four inches. We drew from this animal sixty Paris pints of oil ‡."

Wormius § informs us, that there are three kinds of bears in Norway: the first (*bressdiur*) is very large, not altogether black, but brownish,

* Tom. i. p. 86. † Tom. ii. p. 40.

‡ Letter of Mr. Collinson to M. de Buffon, dated London, February 6, 1767.

§ Mus. Worm. p. 318.

and not so destructive as the other kinds, living only on herbs and the leaves of trees: the second (*ildgiersduir*) is smaller, blacker, and carnivorous, often attacking horses and other animals, especially in autumn: the third (*myrebiorn*) is still smaller, but fails not to be noxious. He is said to feed upon ants, and delights in overturning their hillocks. It has been remarked (he adds, without proof), that these three kinds mix, and produce intermediate species; that the carnivorous kind attacks the flocks, kills every creature, like the wolf, and devours only one or two; that, though carnivorous, they eat wild fruits; and, when the fruit of the service-tree abounds, they become more dangerous, because this sour fruit sets their teeth so much on edge, that nothing but blood or grease can remove this malady, which prevents them from eating with ease. But most of these facts related by Wormius appear to be extremely equivocal; for we have no examples of animals, with appetites so uniformly different as those of the two first species, the one living only on herbs and the leaves of trees, and the other on flesh and blood, intermixing and producing intermediate species. Besides, he makes the black bears carnivorous, and the brown frugivorous, which is absolutely repugnant to truth. Add to this, that P. Rzaczynski *, a Polish writer, and M. Klein of Dantzic †, in describing the bears of their country, mention two species only, the black, and the brown or red; and, of

* Auctuar. Hist. Nat. p. 32. † De Quadrup. p. 82.

the latter, they speak of a larger and lesser kind. They remark, that the black bears are more rare; that the brown, on the contrary, are very common; that the black bears are the largest, and feed upon ants; and, lastly, that the red or brown kind are the most carnivorous and destructive. These proofs, added to those of M. du Pratz and of the baron de la Hontan, are perfectly opposite to what Wormius advances. In a word, it appears to be certain, that the red or brown bears, which are found not only in Savoy, but in the high mountains, in the vast forests, and in almost every desert of the earth, devour live animals, and even the most putrid carcasses. The black bears do not inhabit very cold countries, but we find the brown or red bears in the frozen, the temperate, and even in the southern regions. They were common in Greece; and the Romans brought them from Lybia *, to be exhibited at their public spectacles †. They are found in China ‡, in Japan §, in Arabia, in Egypt ‖, and as far as

* Herodot. Solon. Crinit. et alii. Quod fræno Lybici domantur ursi, says Martial.

† For which purpose they were kept in menageries, and fed by slaves called *ursarii*, who had the sole care of them. *W.*

‡ Hist. Generale des Voyages, par M. l'Abbé Prevost, tom. iii. p. 492. Hist. Nat. du Japan, par Koempfer, tom. i. p. 109.

§ Strabo, lib. xvi. Prosp. Alpin. p. 233.

‖ We have no good reason to believe that the bear ever existed in Egypt. There were not any in Pliny's time; and Herodotus mentions them as rare. *W.*

the island of Java *. Aristotle † likewise mentions white land-bears, and considers this difference of colour as accidental, and proceeding from a defect in generation. Thus bears are found in all desert, rude, and woody countries. But they never appear in populous nations, nor in open and cultivated regions. There are none in France or in Britain, except, perhaps, a few in the most unfrequented mountains of France.

The bear is not only a savage, but a solitary animal. He flies from all society, avoiding every place to which man can have access, and is only easy where Nature appears in her rudest and most ancient form. An old cavern among inaccessible rocks, or a grotto formed by time in the trunk of a decayed tree, in the midst of a thick forest, serves him for an habitation. Thither he retires alone, and passes part of the winter without provisions, and goes not out of it for several weeks. However, he is neither torpid, nor deprived of feeling, like the dormouse and marmot; but, as he is excessively fat about the end of autumn, which is the time he retires, this abundance of grease enables him to endure abstinence; and he departs not from his den till he is almost famished. It is alleged, that the males leave not their retreats for forty days ‡; but that the females continue four months, because it is there that they bring forth their young. It is difficult to believe

* Voyage autour du Monde de le Gentil, tom. iii. p. 85.

† Aristot. de Admir. cap. 140. Ibid. de Gen. Anim. lib. v. cap. 6.

‡ Ibid. Hist. Anim. lib. viii. cap. 17.

that they should not only subsist, but nourish their young, without taking food for so long a period. I allow, that, when pregnant, they are prodigiously fat, and that, being clothed with very thick hair, sleeping the greatest part of the time, and remaining without motion, they must lose little by perspiration. But, if it be true, that the males, pressed with hunger, go out in forty days, it is not natural to think, that the females, after bringing forth and suckling their young, should feel less the want of food, unless we suppose them to devour some of their offspring, together with the membranes, &c., which is not probable, notwithstanding the example of the cats, which sometimes eat their young. Besides, I am here talking of the brown species only, the males of which devour the new-born cubs, when they discover them in their dens. The females, on the contrary, seem to love their offspring with an astonishing ardour: after they bring forth, they are more ferocious and more dangerous than the males. They fight, and expose themselves to every peril, in order to save their young, who are not unformed for some time after birth, as the ancients alleged, but grow nearly as quick as other animals. They are perfectly formed in the womb of the mother *; and, if the fœtus, or young cub, seems, at the first glance, to be ill-formed, it is only because the

* In museo illust. senatus Bononiensis ursulum a cæso matris utero extractum, et omnibus suis partibus formatum, in vase vitreo adhuc servamus.—*Aldrov. de Quadr.* p. 120.

old bear herself, upon the whole, is an animal gross and disproportioned; and we know, that, in every species, the fœtus, or new-born animal, is more disproportioned than the adult *.

Autumn, with the bears, is the season of love: the female is said to be more ardent than the male. It is alleged, that she lies on her back to receive him, that she embraces him closely, and keeps him fast for a long time, &c. It is certain, however, that they copulate like other quadrupeds. Captive bears have been seen coupling, and have been impregnated. But how long the females go with young, has not been so accurately marked as could be wished. Aristotle † has said, that they go with young thirty days only. As nobody has contradicted this fact, and as we are not in a condition to verify it, we, of course, can neither affirm nor deny with regard to this matter. We shall only remark, that it appears to be doubtful: 1. Because the bear is a large animal; and, in proportion to the size of animals, they require the longer time to be formed in the womb: 2. Because the young bears grow

* When the young are first whelped, they are yellow, with a white mark round the neck, and do not look much like bears: their eyes are closed during four weeks: they are about eight inches long when first born, but increase to fourteen or fifteen at the end of three months: at that age they appear almost round, and their snout is very sharp and pointed. They do not acquire much strength till they are full grown, before which time they have lost their white hair, which gradually decreases, and the yellow is changed into brown. *W.*

† Arist. Hist. Animal, lib. vi. cap. 30.

very slowly; they follow their mother, and require her assistance, for a year or two: 3. Because the female produces but one, two, three, four, and never more than five; a property common to all large animals, who produce but a few young, and carry them long: 4. Because the bear lives twenty or twenty-five years, and the time of gestation and that of growth are generally proportioned to the duration of life. From these analogies, I am inclined to believe that the bear goes with young at least several months. However this matter stands, the mother takes the greatest care of her young. She prepares for them a bed of moss and herbs in the bottom of her cavern, and suckles them till they are able to go abroad with her. She brings forth in winter, and the cubs begin to follow her in the spring. The male and female live not together; but each has a separate and a distant retreat. When they cannot find a cavern for a den to make a lodging, they break and collect branches of trees, which they so cover with herbs and leaves as to render them impenetrable by water.

The voice of the bear is a deep murmuring, often accompanied with a grinding of the teeth, especially when irritated. He is very susceptible of anger, which is always furious, and often capricious. Though, when tamed, he appears mild and even obedient to his master, he should always be treated with diffidence and circumspection; and we should be particularly careful not to strike him on the nose, or on the parts of generation. He may be taught to walk on

end, to dance, and to perform various gesticulations. He seems even to listen to music, and to observe some kind of measure. But to give him this species of education, he must be taken young, and constrained during life. An old bear cannot be tamed, nor will he suffer restraint. He is naturally intrepid, or, at least, indifferent to danger. The wild bear never turns out of his road, nor flies from the aspect of man. It is alleged, however, that the sound of a whistle * surprises and confounds him to such a degree, that he rises on his hind-feet. This is the time for shooting, and endeavouring to kill him; for, if he be only wounded, he attacks the huntsman with fury, embraces him with his fore-feet, and suffocates him †, if not timely assisted ‡.

Bears are hunted in different manners. In Sweden, Norway, Poland, &c.

The bears of Norway are more common in the provinces of Bergen and Drontheim, than in the other districts of that country. Two races of them are remarked, of which the one is considerably smaller than the other. In the colours of

* Voyages de Regnard, tom. i. p. 37.

† Id. ibid. Hist. de la Louisiane, par M. du Pratz, tom. ii. p. 81.

‡ In passing through Lithuania, Mr. Coxe observed, in various parts of the forest, circular ranges of boards fixed to several trees twelve feet from the ground, and projecting three from the trunk. On great hunting parties, ladders are placed against these scaffoldings; and the hunters, if closely pressed by a bear, ascend the ladder, and draw it up after them: the bear, although an excellent climber, is stopped in his ascent by the projection of the boards. *W.*

both, there are great varieties. Some of them are of a deep brown, others of a shining brown; and some are gray, and of every shade of white. At the beginning of October, they retire into the dens they prepare for themselves, and where they make a kind of bed composed of moss and leaves of trees. As these animals are very formidable, especially when wounded, there are seldom less than three or four hunters in company; and, as the bear easily kills large dogs, they employ only small dogs, who pass under his belly, and seize him by the genitals. When he finds himself overpowered, he leans his back against a rock or a tree, collects turf and stones, which he throws at his enemies; and it is generally in this situation that he receives the finishing blow * †.

* Pontoppidan's Natural History of Norway.

† In America, says Mr. Pennant, the chase of these animals is a matter of the first importance, and never undertaken without abundance of ceremony. A principal warrior first gives a general invitation to all the hunters. This is followed by a most serious fast for eight days, a total abstinence from all kinds of food; notwithstanding which, they pass the day in continual song. This they do to invoke the spirits of the woods to direct them to the place where there are abundance of bears. They even cut their flesh to render the spirits more propitious. They also address the *manes* of the beasts slain in preceding chases, as if it were to direct them in their dreams to plenty of game. One dreamer alone cannot determine the place of chase, numbers must concur; but, as they tell each other their dreams, they never fail to agree.

The chief of the hunt now gives a great feast, at which no one dares to appear without first bathing. At this entertainment they eat with great moderation, contrary to their usual custom. The master of the feast alone touches nothing; but is employed in relating to his guests ancient tales of the won-

The safest way of managing bears, it is said *, is to intoxicate them by throwing ardent spirits on honey, of which they are fond, and search for it in the trunks of trees. In Louisiana and Canada, where the black bears are common, and where they live not in caverns, but in decayed trees, they are taken by setting their habitations on fire †. As

derful feats in former chases; and fresh invocations to the *manes* of the deceased bears conclude the whole. They then sally forth, amidst the acclamations of the village, equipped as if for war, and painted black. Every able hunter is on a level with a great warrior; but he must have killed his dozen great beasts before his character is established: after which his alliance is as much courted as that of the most valiant captain. They now proceed on their way in a direct line; neither rivers, marshes, or any other impediment, stop their course; driving before them all the beasts which they find in their way. When they arrive in the hunting ground, they surround as large a space as their company will admit, and then contract their circle, searching, as they contract, every hollow tree, and every place fit for the retreat of a bear; and continue the same practice till the time of the chase is expired.

As soon as a bear is killed, a hunter puts into his mouth a lighted pipe of tobacco, and, blowing into it, fills the throat with smoke, conjuring the spirit of the animal not to resent what they are going to do to its body; nor to render their future chases unsuccessful. As the beast makes no reply, they cut out the string of the tongue, and throw it into the fire: if it crackles and runs in (which it is almost sure to do), they accept it as a good omen: if not, they consider that the spirit of the beast is not appeased; and that the chase of the next year will be unfortunate. — *Arctic Zool.* i. p. 63.

W.

* Voyages de Regnard, tom. i. p. 53.

† Mem. sur la Louisiane, par M. Dumont, p. 75. Hist. de la Louisiane, par M. du Pratz, tom. ii. p. 87.

they climb trees with ease, they seldom reside on a level with the ground, and their habitations are often thirty or forty feet high. If it be a mother with her young, she descends first, and is slain before she reaches the ground. The cubs follow, are seized by throwing a ropè round their necks, and carried off either for the purposes of training or eating them; for the flesh of the cubs is delicate and good: that of the adult is eatable; but, as it is mixed with an oily fat, the paws alone, which are more compact, are reckoned a delicate dish.

The hunting of the bear, without being very dangerous, is extremely lucrative when performed with success. The skin is a valuable fur, and the quantity of oil drawn from a single bear is considerable. The flesh and fat are boiled together in a caldron, and the oil is easily separated. "Afterwards," says M. du Pratz, "the oil is purified, by throwing it, when very warm, into a quantity of salt and water. A detonation ensues, and a thick smoke rises, which carries off the disagreeable odour of the grease. When the smoke ceases, and while the grease is still warm, it is put into a pot, where it is allowed to remain for eight or ten days. At the end of this period, a clear oil is seen swimming on the top, which is taken off with a ladle. This oil is equally good, and answers the same purposes, as the best olive oil. Beneath, we find a lard as white, but a little softer than hog's lard. It serves for culinary purposes, and has no bad taste or smell."

M. Dumont, in his Memoirs of Louisiana, agrees with M. du Pratz, and adds, that, from a single bear, they obtain more than 120 pots of this oil; that the savages traffick in this article with the French; that it is very wholesome and good; that it never congeals but during great colds, and, when this happens, it is all clotted and of a dazzling whiteness; and that it is then eaten upon bread like butter. Our druggists keep no bear's grease, but import, from Savoy, Switzerland, or Canada, axungium, which is by no means pure. The author of the Dictionary of Commerce affirms, that good bear's grease should be grayish, viscid, and of a disagreeable odour; and that, when too white, it is sophisticated and mixed with suet. It is applied topically in hernias, rheumatism, &c., and many persons assure us, that they have felt its good effects.

The amazing fatness of the bear makes him light for swimming; and, accordingly, he traverses, with ease, rivers and lakes. "The bears of Louisiana," says Dumont*, "which are of a fine black colour, cross the river, notwithstanding its great breadth. They are remarkably fond of the fruit of the *plaqueminier*, *guiacana* † ‡, or date

* Mem. sur la Louisiane, p. 76.

† For an account of this tree, see Dict. Raisonné d'Hist. Nat. par Bomare.

‡ Diospyros Virginiana, Linn. A tree about sixty feet high: yields a subacid fruit, not, in flavour, unlike the medlar: grows naturally in many parts of North America.— *Duhamel, Arb.* i. p. 183.— *Lamarck. Encyclop. Botan.* *W.*

plumb-tree: they climb these trees, sit astride upon a branch, keep themselves firm with one paw, and collect the fruit with the other. They frequently come from the woods into the cultivated fields to eat potatoes and yams." In autumn, they are so fat, that they can hardly walk *, or, at least, they cannot run so quick as a man †. Upon the sides and thighs they have sometimes ten inches thick of fat ‡. The soles of their feet are gross and inflated. When wounded, there issues out a white lacteous juice. This part appears to be composed of small glands like *papillæ*; and it is for this reason, that these animals, during their winter retreat, continually suck their paws.

The bear enjoys, in an excellent degree, the senses of seeing, hearing, and touching, though his eye is proportionally small, his ears short, and his skin thick and covered with bushy hair. His sense of smelling is, perhaps, more exquisite than that of any other animal; for the internal surface of this organ is very much extended, having four rows § of bony plates, separated from each other by three perpendicular planes, which increase prodigiously the surface proper for the reception of impressions from odoriferous bodies.

* Voyage du Baron de la Hontan, p. 86.

† Hist. de la Louisiane, par M. du Pratz, p. 83.

‡ Extrait d'un ouvrage Danois cité par Mrs. Arnauld de Nobleville et Salerne.—*Hist. Nat. des Anim.* tom. vi. p. 374.

§ Etienne Lorentinus, Ephem. d'Allem. decur. i. an. ix. et x. p. 403, cité par Mrs. Arnauld de Nobleville et Salerne.—*Hist. Nat. des Anim.* tom. vi. p. 366.

He has fleshy legs and arms, like those of a man, a short heel-bone, which forms a part of the sole of the foot, five metatarsal bones opposed to the heel in the hind-feet, and an equal number of metacarpal bones in the fore-feet. But the thumb is not separated, and the largest finger is on the outside of this species of hand; whereas, in man, it is on the inside. His toes are thick, short, and locked to each other, both in the hands and feet. His nails are black, and of a hard homogeneous substance. But these gross resemblances to man render the bear only more deformed, and give him no superiority over the other animals.

M. de Musly, major of artillery in the service of the States General, has communicated some notices concerning domestic bears, of which the following is an extract.

" At Berne, where these animals are nourished," says M. de Musly, " they are kept in large square ditches, where they have room to walk about. These ditches are covered above, and lined with stone, both at the bottom and on the sides. Their lodges, or cabins, are likewise paved on a level with the bottom of the ditch, divided into two by walls, and may be shut both internally and externally by iron gates. In the middle of these ditches, there are large holes in the pavement, where considerable trees may be set up on end. There is likewise, in each ditch, a trough full of fresh water.

" Two young brown bears were transported here from Savoy, thirty-one years ago, of which the female is still alive; the male was killed about

two months ago, by a fall from one of the high trees planted in the ditch. They began to generate at the age of five years: since that time, they have every year come in season during the month of June; and the female has always brought forth in the beginning of January. The first time she produced one cub only, and afterwards, sometimes one, sometimes two, and sometimes three, but never more; and the three last years she brought forth one only at each time. The man who takes care of her, thinks her still pregnant (October 17, 1771). When the young come into the world, their figure is pretty; their colour is yellow, but white round the neck; and they have not the least appearance of bears. The mother is extremely fond of them. Their eyes are shut during four weeks. At first they exceed not eight inches in length; and three months after, they measure fourteen or fifteen inches from the end of the muzzle to the root of the tail; and their hair is nearly an inch long. Their figure is then almost round, and the muzzle is very sharp pointed; so that a person would hardly know them. They afterwards become weak and tender till they acquire their full growth; the white colour is gradually effaced, and the yellow changes into brown *.

During the act of copulation the male commences with short, but brisk movements, which last about a quarter of a minute; he then reposes

* See page 106, where it was thought convenient to insert the above observations in a note. *W.*

double that time upon the female, without disengaging himself: in this manner he proceeds for three or four times; and when the operation is finished, the male bathes himself in the trough up to the neck. They sometimes fight cruelly, making a horrible grumbling noise. But, in the season of love, the female has generally the advantage, because the male, at that time, spares her. The ditches, which formerly were in the town, are now filled up, and others are made between the ramparts and the old walls. These two bears, having been separated some hours when removing into new ditches, raised themselves on an end when they again met, and embraced each other with transport. After the death of the male the female appeared to be much afflicted, and refused every kind of nourishment for several days. But unless these animals be brought up and fed together from their earliest youth, they cannot endure one another; and, after being accustomed to this kind of society, the survivor will not admit another mate.

" The trees put yearly into the ditches in the month of May, are green larches, in climbing up which the bears take vast delight. They are fed with rye bread, which is cut into large morsels, and steeped in warm water. They likewise eat all sorts of fruits; and when any unripe fruits are brought to the market, they are thrown in to the bears by order of the magistrate. It has been remarked, however, that some bears prefer pulse to the fruits of trees. When the female is about to bring forth, they give her plenty

of straw, of which she makes a rampart. After this the male is removed, lest he should eat the cubs; and when she has littered, she is fed with a more nourishing diet than usual. We never could perceive any part of the membranes or after-birth, which makes it probable that she ate them. The cubs are allowed to remain with her for ten weeks; and are afterwards separated, and fed, for some time, with milk and biscuit.

" The bear which we believed to be in a state of pregnancy was furnished, about the common time, with straw, of which she made a bed, and rested on it during three weeks, without producing any thing. She brought forth, for the last time, at the age of thirty-one, in the month of January, 1771; but, though she received the male in the following June, it was ineffectual in January, 1772. It were to be wished that she was allowed to live, in order to discover the term fixed by Nature for the duration of these animals *.

* Sonnini tells us that two of these bears, from the ditches of Berne, have been brought to France and placed in the dens of the Menagerie of the *Jardin des Plantes* at Paris, where they have hardly room to turn. These animals, in their confinement, are fed indifferently with bread, fruit, soup, and meat. But seem to suffer greatly for want of proper accommodation. When they were first brought to Paris, it was found very difficult to force them from the cage, as they, for a time, obstinately resisted every effort to get them out. Sonnini adds, that they are not mischievous, know the voice of their keeper, and are tolerably tractable.

Bears are said to become susceptible of attachment to mankind, when they have been carefully brought up, and tenderly used by them. As a proof of this, Lionnois has intro-

"There are brown bears on Mount Jura, upon the frontiers of our canton, in Franche-compté, and in the country of Gex. When they descend into the plains in autumn, they repair to the chesnut woods, where they make great havoc. In this country the bears are said to have weak eyes, but acute senses of hearing, touching, and smelling."

duced the following anecdote in his *Essai sur la ville de Nancy*.

Since the time of René the Second, the dukes of Lorraine have constantly kept a bear, in acknowledgement of some assistance afforded them by the inhabitants of Berne (who quarter this animal on their arms) while they were engaged against the duke of Burgundy. In the reign of Leopold, a little Savoyard, perishing with the cold of 1709, ventured into the den of the duke's bear. Masco (which was the name of the animal), far from doing the boy any mischief, took him between his paws, and warmed him at his breast. The next day he suffered the Savoyard to depart, who, after having spent the day abroad, returned at night to the den, and was received with the same affection. This continued for some time, the boy always spending the day at a distance from the cell and returning in the evening, when he constantly found a portion of food reserved for him by the bear. One day his keeper brought Masco his food later than usual, and was surprised to find him laying down, his eyes sparkling, and his look wild and furious, as if determined to be revenged on whoever disturbed him. At this moment he held the young Savoyard between his paws, who was in a deep sleep, and Masco would by no means hazard the waking him to satisfy his own appetite. The court of Leopold, as well as the inhabitants of Nancy, witnessed this mark of affection in the bear, and the circumstance would have made the fortune of the young Savoyard, if he had not died prematurely.

W.

118A

A Bell Sculp.

WHITE or POLAR BEAR.

THE WHITE, OR POLAR BEAR*.

THE white bear is a famous animal in our most northern regions. It is mentioned by Martin, and some other voyagers. But none of

* CHARACTER SPECIFICUS.

Ursus Maritimus. U. albus, cauda abrupta, capite colloque elongatis.—*Linn. Syst. Nat. Gmel.* i. p. 101.—*Erxleb. Mamm.* p. 160.—*Schreb.* iii. p. 513, pl. 141.

Ursus albus, cauda unicolore.—*Briss. Quadr.* p. 188.

Ursus maritimus albus major arcticus.—*Martin's Spitzb.* p. 73, t. O. F. C.

Ursus Marinus.—*Pallas, It.* iii. p. 691, et *Spicil. Zool.* xiv. p. 1—24, pl. 1.

Ursus Albus.—*Jonst. Quadr.* p. 126.

L'Ours Blanc.—*Buff. Hist. Nat. par Sonn.* xxvi. p. 83, et xxxiii. p. 287, pl. 24.

White Bear.—*Catesby's Carol. App.* p. 26.

Polar Bear.—*Penn. Hist. Quadr.* ii. p. 5, pl. 61.—*Bew. Quadr.* p. 268.—*Shaw's Gen. Zool.* i. p. 457, pl. 103.—*Mus. Lever.* i. p. 7. pl. 2.

HABITAT

intra circulum arcticum polarem, casu interdum a glacie defertur in regiones magis australes. Ad litora degit, inque glaciei insulis. Hibernat sub nive in fossis profundis.

W.

Polar bear, with long head and neck; short round ears; end of the nose black; vast teeth; hair long, soft, white, and tinged in some parts with yellow; limbs of great size and

their descriptions are so complete as to enable us to ascertain whether it differs in species from the common bear. If what they have said, however, be exact, it is probably a distinct species. But, as we know that the wolf varies in different climates, some of them being black, others brown, others white, and others variegated, colour is a character of no value in constituting different species. I saw two small bears which had been brought from Russia, and were entirely white *, and yet they were unquestionably of the same species with our Alpine bears. These animals likewise vary greatly in size. As they live long, and become very thick and fat in places where they have plenty of nourishment, and are not disturbed, the character drawn from magnitude is equivocal. Hence we are not authorized to conclude, that the bear of the northern seas is a peculiar species, solely because he is white and larger than the common kind †.

strength. It grows to a vast size, the skins of some being thirteen feet long. — *Penn. Synops. Quadr.* p. 192.

* We find white land-bears not only in Russia, but in Poland, Siberia, and Tartary. The mountains of Great Tartary furnish vast numbers of white bears. — *Relat. de Grande Tartarie*, p. 8. These mountain bears do not frequent the sea, and yet they are white. This colour, therefore, seems rather to proceed from the difference of climate than from that of the element inhabited by these animals.

† Ursus in Polonia variat, maximus nigricans, minor fulvus, minimus argentinus, in confiniis Moschoviæ pilis nigris et argentei coloris mixtis. . . . . . ex Urso occiso pellis detracta fere ad ulnas sex protendebatur in terra *Chelmensi*, altera in Palatinatu *Braclaviensi*, tertia ad ulnas quinque in

The difference of habits seems not to be more decisive than that of colour and magnitude. The bear of the northern seas feeds upon fishes. He never quits the margins of the sea, and often inhabits the floating islands of ice. But, if we consider that the bear is an animal which eats every thing, that, when pressed with hunger, he has no choice, and that he is not afraid of water, these habits will not appear sufficient to form distinct species. The fish eaten by the sea-bears is rather a kind of flesh, being chiefly the carcasses of whales, walruses, and seals. The climate produces no other animals. Neither does it afford grain or fruits; and, consequently, the bear is under the necessity of subsisting on the productions of the sea. Is it not probable that our bears, if transported to the mountains of Spitzbergen, and finding no food upon land, would take to the sea in quest of subsistence?

Colour, size, and mode of living, being insufficient, no other essential characters remain but those which may be derived from figure. Now, all that voyagers have said of the sea-bear amounts only to this, that his head, body, and hair, are longer than those of our bear, and that his skull is much harder. If these differences were real and considerable, they would be sufficient to constitute a separate species. But I am not certain that Martin has examined with accuracy, and that the other writers who copied

Bondurgoute pago Palatinatus Pomeraniæ . . . . non raro ex Lithuania advehuntur Gedanum pelles octo pedum.—*Rzaczinski*, p. 322. *Nota*, This passage proves that there are white land-bears as large as those of the northern seas.

him have not exaggerated *. "These white bears," he remarks, "are quite otherwise shaped than those that are seen in our country; they have a long head like unto a dog, and a long neck, and they bark like dogs that are hoarse, and all their whole body is much otherwise shaped than ours. They are slender in the body, and a great deal swifter †." This description furnishes the following remarks: 1. That the author does not make these bears larger than ours, and, consequently, that we ought to suspect the evidence of those who tell us that the sea-bear is sometimes thirteen feet in length ‡. 2. That hair as soft as wool is not a specific character; for, to render hair soft, and even more bushy, it is only necessary that an animal be frequently in the water, as appears from the land and water beavers. The latter, who dwell oftener in the water than on land, have coarser and less bushy hair: and, I am inclined to think, that the other differences are neither real nor so conspicuous as Martin would have us to believe; for Dithmar Blefken, in his description of Iceland, mentions these bears, and assures us, that he saw one killed in Greenland, which raised itself on the two hind-feet, like our bears; but he says not one word which indicates that the white bear of Greenland is not entirely similar to

* Anderson's Hist. of Greenland; and Ellis's Voyage to Hudson's Bay.

† Martin's Voyage to Spitzbergen, p. 100.

‡ A white bear, which had been killed, was brought aboard. Its skin was thirteen feet long. — *Troisième Voyage des Hollandois, par le Nord*, p. 35.

ours *. Besides, when these animals find prey on land, they never go to sea in quest of food. They devour rein-deer, and such other animals as they can seize. They even attack men, and never fail to dig up dead bodies †. But hunger, which they often feel in these desert and barren lands, obliges them to frequent the water, in quest of seals, young walruses, and whales. They take up their residence on islands of ice, on which they are often seen floating, and never abandon their station as long as they can find abundance of food. When these islands of ice are detached in the spring, the bears allow themselves to be carried along; and, as they cannot regain the land, or abandon the ice on which they are embarked, they often perish in the open sea ‡. Those which arrive with the ice on the

* Habet Islandia coloris albi ingentes Ursos . . . . in Grœnlandia ursum magnum et album habuimus obviam, qui neque nos timebat neque nostro clamore abigi poterat, verum recta ad nos tanquam ad certam prædam contendebat, cumque propius nos accessisset, in bonbarda trajectus, ibi demum erectus, posterioribus pedibus tanquam homo stabat donec tertio trajiceretur, atque ita exanimatus concidit. — *Dithmar Blefken*, p. 64.

† The white bears live upon dead whales; and, in the neighbourhood of these carcasses, they are most frequently found. They likewise devour men, when they can surprise them. If they scent a place where a dead body is interred, they remove the earth and stones, open the coffin, and eat the carcass. — *Recueil des Voyages du Nord*, tom. ii. p. 116.

‡ The summer months are spent on the islands of ice, but in the winter the bears seek a lodging in the natural caverns formed by stupendous masses of ice, which, being piled one over another, leave large cavities beneath. They pass the long and dismal winter nights of those inclement regions in

coasts of Iceland or Norway *, are starved to such a degree, that they devour every thing they meet, which may have given rise to the prejudice, that these sea-bears are more fierce and voracious than the common kind. Some authors tell us, that the sea-bears are amphibious like the seals, and that they can live as long as they please under water. But the contrary is evident from the manner of hunting them: they are incapable of swimming long, and never accomplish above a league at a time. They are followed by a small boat, and are soon worn out with fatigue. If they could dispense with respiration, they would dive to the bottom, in order to rest themselves. But, when they dive, it is only for a few seconds; and, for fear of drowning, they allow themselves to be killed on the surface of the water †.

deep beds of snow, which they fashion to their purpose, and there remain in a torpid state till the refreshing appearance of the vernal sun calls them forth from their retreats.

W.

* When the islands of ice separate from the north of Greenland, and are driven southward, the white bears dare not depart from them. When they arrive in Norway, or at any island, they are mad with hunger; and strange stories are told of the ravages made by these animals. — *Recueil des Voyages du Nord,* tom. i. p. 100.

† This white bear swam about a mile. We pursued him briskly with three boats; and, after he was fatigued, we killed him. — *Trois Navigations des Hollandois du Nord, par Gerard de Vera,* p. 110. They swim from one mass of ice to another; when we pursued them in our boats, they dived at one end of the boat, and came up at the other. They likewise run very well upon land. — *Recueil des Voyages du Nord,* tom. ii. p. 116. Upon the coast of Spitzbergen, a

Seals are the common prey of the white bears *. But the walrus, from whom they sometimes carry off the young, pierces them with its tusks, and puts them to flight. The whale likewise overwhelms them by its weight, and banishes them from the places they frequent. They sometimes, however, devour the young whales. All bears are naturally very fat; and the white bears, which live upon animals loaded with grease, are fatter than the common kind. Their fat is very like that of the whale. The flesh of these bears is not bad, and their skin makes a very warm and durable fur †.

I have given a figure of the white sea-bear, from a drawing sent me by the late Mr. Colin-

white bear took the water, and swam more than a league. We followed with our boats, and killed him, &c. — *Troisième Voyage des Hollandois*, p. 34.

* When we killed this white bear, his stomach was opened, in which we found entire pieces of the sea-dog, with the hair and skin on them, which shows that he had but lately devoured them. — *Ibid.* p. 36.

† The white bears go in quest of wolves and sea-dogs, and prefer whales to every other fish. . . . . They dread the whale, who scents and pursues them from a natural antipathy, because they eat her young. — *Recueil des Voy. du Nord*, tom. i. p. 99. The skins of the white bears are of great use to those who travel in winter. They are dressed, even at Spitzbergen by steeping them in warm water, which extracts the grease; and they are afterwards dried. . . . . Their grease is like suet, and, after being well melted, it becomes as clear as whale oil. It is generally burnt in lamps, and has not so bad a smell as fish oil. Our sailors sell it for whale oil.

son. If this drawing be exact, it is certain that the sea-bear is a different species from the land-bear. The head is so long, when compared with that of the common bear, that this character alone is sufficient to constitute a distinct species: and those voyagers adhere to truth when they tell us, that the figure of the sea-bear is totally different from ours, and that its head and neck are much longer. From the drawing it likewise appears, that the feet, instead of resembling the human hand, like those of the land-bear, are formed nearly like the feet of a large dog, and other carnivorous animals of this kind. Besides, from several relations, it appears, that some of these bears are much larger than the land-bear. Gerard de Veira asserts, that, after killing one of these bears, he measured the skin, and found it to be twenty-three feet long; which is more than triple the length of the common bear* †. We likewise find, from the Collection of Voyages to the North, that these sea-bears are larger and more ferocious than ours. But, in the same Collection, it is said, that, though these bears are differently formed, and have the head and neck much longer, and the body more slender and agile, they are nearly of the same size with the common kind ‡.

All voyagers likewise agree, that the sea-bears

The flesh of these bears is fat and whitish. Their milk is very white and fat.—*Troisième Voy. des Hollandois*, tom. ii. p. 115.

* Trois Navigations admirables faites par les Hollandois au Septentrion, p. 110.

† This is probably a great exaggeration; thirteen feet is considered an extraordinary length. *W.*

‡ Recueil des Voyages du Nord, tom. ii p. 115.

have the bones of the head so hard, that no blow of a club, though sufficient to bring an ox to the ground, can stun them; and that their voice rather resembles the barking of an enraged dog than the deep murmuring cry of the common bear. Robert Lade assures us, that, in the environs of the river Rupper, he killed two sea-bears of a prodigious size; that these famished and ferocious animals attacked the hunters with such impetuosity, that they killed several savages, and wounded two Englishmen. In page 34, of the Third Dutch Voyage to the North, we are told, that the sailors killed, on the coast of Nova Zembla, a sea-bear whose skin was thirteen feet long. Upon the whole, therefore, I am inclined to believe, that this animal, so much celebrated for its ferocity, is really a much larger species than our bear *.

* The polar bear is of great use to the Greenlanders, who split his tendons into threads for sewing, and make boots, shoes, and gloves of his skin. They likewise feed on his flesh and fat, which last is so excessive, that a hundred pounds has been taken out of a single beast. The only unwholesome part about the animal is the liver; which is so pernicious, that three of Hemskirk's sailors were very ill after eating some of it boiled.

The polar bear has been occasionally brought to England, but the warmth of the climate makes him very restless. There was one in the royal menagery as early as the reign of Henry the Third; and in Madox's Antiquities of the Exchequer, there are two writs extant from that monarch, directing the sheriffs of London to furnish sixpence a day to support *our* white bear in our Tower of London; and to provide a muzzle and iron chain to hold him when out of the water; and a long and strong rope to hold him when he is fishing in the Thames.

W.

THE BEAVER*.

IN proportion as man rises above a state of nature, the other animals sink below that standard: reduced to slavery, or treated as rebels, and

* CASTOR.

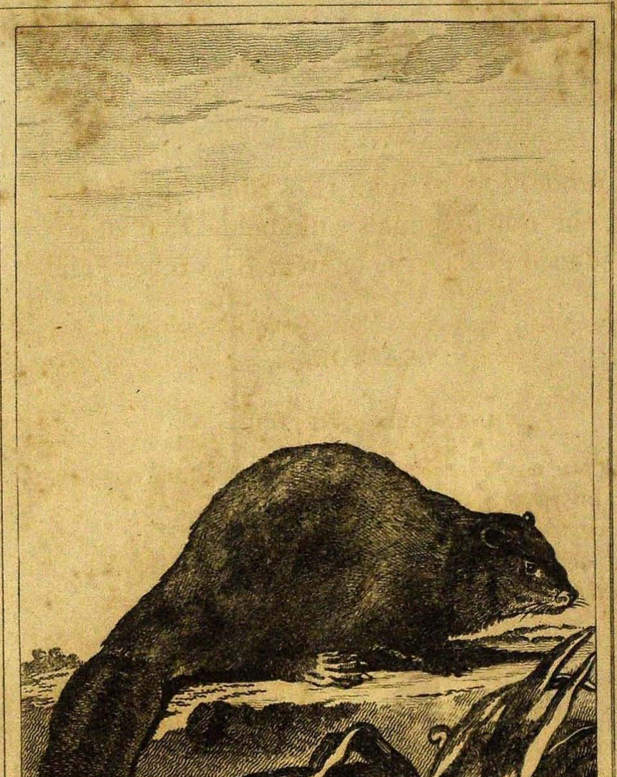
CHARACTER GENERICUS.

Dentes primores superiores truncati, angulo transverso excavati. Inferiores apice tranversi.
Molares utrinque quatuor.
Cauda longa, depressa, squamosa.
Claviculæ perfectæ.

CHARACTER SPECIFICUS.

Castor Fiber. C. cauda ovata plana calva.—*Linn. Syst. Nat. Gmel.* i. p. 124.—*Schreb.* iv. p. 623, pl. 175.
Castor Fiber. C. cauda depressa ovata.—*Erxleb. Mamm.* p. 440.
Castor castanei coloris, cauda horisontaliter plana.—*Briss. Quadr.* p. 133.
Castor.—*Gesn. Quadr.* p. 309.—*Aldrov.* p. 276.—*Jonst. Quadr.* p. 147, pl. 68.—*Ray's Quadr.* p. 209.
Fiber.—*Belon, Aq.* p. 30.
Le Castor.—*Buff. Hist. Nat. par Sonn.* xxvi. p. 92, pl. 5, fig. 1.
Beaver.—*Penn. Hist. Quadr.* ii. p. 114, pl. 71.—*Shaw's Gen. Zool.* ii. p. 30, pl. 128.—*Catesb. Carol. App.* p. 29.—*Wood's Zoography.* i. p. 274, pl. 12 and 13.

Plate 156



BEAVER.

dispersed by force, their societies have vanished, their industry and genius have become barren, their arts have disappeared, each species has lost its general qualities, and the whole have preserved only their individual properties, matured, in some, by example, by imitation, and by instruction; and, in others, by fear, and by the necessity of perpetually watching over their own safety. What views, what designs can be possessed by slaves without spirit, or exiles without power? Compelled to fly, and to exist in solitude, they can attain to no improvement; they can neither acquire nor transmit knowledge, but must continually languish in calamity and decay; they must perpetuate without multiply-

HABITAT

in Europa frigida et temperata, hodie Angliæ exul, non olim: præcipue autem vivit in borealibus imprimis Asiæ, maxime Americæ, ad ripas fluviorum lacuumque solitarias silvosas.

Architectura in construendo domos, ad ripas ante hienem superat omnium animalium.

W.

The beaver has two cutting teeth in each jaw, five toes on each foot, and a tail compressed, and covered with scales. He has strong cutting teeth, short ears hid in the fur, a blunt nose, hair of a deep chesnut brown, a broad, almost oval, tail, compressed horizontally, and with scales; the fore-feet are small and the hind-feet large; the length, from nose to tail, is about three feet; and the tail is eleven inches long, and three broad. — *Penn. Synops. Quadr.*

In Greek, *κάστωρ*; in Italian, *Bivarro, Bevero;* in Spanish, *Bevaro*; in German, *Biber*; in Swedish, *Baeffwer*; in Polish, *Bobr*; in French, *Le Castor*, or *Le Bièvre*.

ing; and, in a word, they must lose by their duration more than they acquire by experience.

It is for this reason that there are now no remains of that astonishing industry of animals, except in those distant and desert regions where, for a long succession of ages, they have received no disturbance from man, where each species can display with freedom its natural talents, and mature them in quiet, by uniting into permanent societies. The beavers afford, perhaps, the only subsisting monument of the ancient intelligence of brutes, which, though infinitely inferior in principle to the human intellect, supposes common projects and relative views; projects which, having society for their basis, and, for their object, a dike to construct, a town to build, or a republic to found, imply some mode of making themselves understood, and the capacity of acting in concert.

The beavers are said to be, among quadrupeds, what the bees are among the insect tribes. There are in Nature, as she now appears, three species of societies, which must be examined before we can compare them: the free society of man, from which, next to God, he derives all his power; the constrained society of the larger animals, which always flies before that of man; and the necessary society of certain small creatures, which, being all produced at the same time, and in the same place, are obliged to live together. An individual, solitary as he comes from the hand of Nature, is a sterile being, whose industry is limited to the simple use of his senses. Even

man himself, in a state of pure nature, deprived of the light and assistance of society, neither multiplies nor constructs. Fertility, on the contrary, is the necessary result of every society, however blind or fortuitous, provided it be composed of creatures of the same nature. From the necessity alone of desiring to approach or to avoid each other, common movements arise, from which there often results a work, that has the air of being concerted, managed, and executed with intelligence. Thus the works of bees, each of whom, in a given place, such as a hive, or the hollow of an old tree, builds a cell; the works of the Cayenne bee, or fly, which not only makes the cells, but the hive that is to contain them; are operations purely mechanical, and imply no intelligence, no concerted project, no general views; they are labours which, being the produce of a physical necessity, a result of common movements *, are at all times, and in all places, uniformly executed in the same manner, by a multitude not assembled from choice, but united by the force of nature. Hence, it is not society, but numbers alone, which operate here. It is a blind power, never to be compared to that light by which all society is directed. I speak not of that pure light, that ray of divinity, which has been imparted to man alone. Of this the beavers, as well as all the other animals, are most assuredly deprived. But their society, not being a union of constraint, but proceeding from a spe-

* See vol. iii. Dissertation on the Nature of Animals.

cies of choice, and supposing, at least, a general concert and common views in its members, implies likewise a certain degree of intelligence, which, though different in principle from that of man, produces effects so similar as to admit of comparison, not, indeed, to the luminous society of polished nations, but to the rudiments of it, as they appear among savages, whose union and operations can alone, with propriety, be compared to those of certain animals.

Let us then examine the product of each of these associations; let us see how far the art of the beaver extends, and to what the talents of the savage are limited. To break a branch, and to make a staff of it, to build a hut, and to cover it with leaves for shelter, to collect hay or moss, and to make a bed of these materials, are operations common to the animal and to the savage. The beavers build huts, the monkeys carry staves, and several other animals make commodious and neat houses, which are impenetrable to water. To sharpen a stone by friction, and make a hatchet of it, to use this hatchet for cutting or peeling the bark off of trees, for pointing arrows, for hollowing a vessel, or for slaying an animal in order to clothe themselves with its skin, to make bow-strings of its sinews, to fix the sinews to a hard thorn or bone, and to use these for needles and thread, are actions purely individual, which man in solitude may perform without the aid of others: actions which depend solely on conformation, because they suppose nothing but the use of the hand. But, to cut and transport a

large tree, to build a village, or to conduct a large canoe, are operations, on the contrary, which necessarily suppose common labour and concerted views. These works are the result of infant society in savage nations; but the operations of the beavers are the fruits of society already matured among these animals; for it must be remarked, that they never think of building, but in countries where they are perfectly free and undisturbed. There are beavers in Languedoc, and in the islands of the Rhone; and they abound in many of the northern provinces of Europe. But, as all these countries are inhabited, or, at least, frequented by men, the beavers there, like all the other animals, are dispersed, solitary, fugitive, and timid creatures. They have never been known to unite, or to construct any common work. But, in desert regions, where men have been slow in forming societies, and where some vestiges only of savages could be traced, the beavers have every where united, formed associations, and constructed works which continue to excite admiration. Of this I shall endeavour to quote the most judicious and irreproachable authorities, and shall hold as certain only those facts concerning which authors agree. Less inclined, perhaps, than some of them, to indulge admiration, I shall venture to doubt, and even to criticise, every article that appears too hard to be credited.

It is universally allowed, that the beaver, in his purely individual qualities, instead of possessing any marked superiority over the other ani-

mals, appears, on the contrary, to sink considerably below some of them: and I am enabled to confirm this fact, being possessed of a young beaver, sent me from Canada*, which I have kept alive near twelve months. This animal is very gentle, peaceable, and familiar. It is somewhat melancholy, and even plaintive; but has no violence or vehemence in its passions. Its movements are slow, and its efforts feeble; yet it is seriously occupied with a desire of liberty, gnawing, from time to time, the gates of its prison, but without fury or precipitation, and with the sole view of making an opening for its escape. In other matters, it seems to be extremely indifferent, forming no attachments†, and neither wishes to hurt nor to please. In these relative qualities, which would make him approach to man, he seems to be inferior to the dog. He appears to be formed neither for serving, commanding, nor even holding commerce with any other species than his own. His sense, locked up in his own person, never entirely manifests itself but among his own tribe. When alone, he has little personal industry, less artifice, and hardly prudence enough to avoid the grossest snares. Instead of attacking other animals, he is very awkward in defending himself. He prefers flight to

* This beaver was taken when very young, and transmitted to me in the beginning of the year 1758, by M. de Montbelliard, a captain of the royal artillery.

† We are told, however, by M. Klein, that he fed a beaver during several years, and that it followed, and went in quest of him, as dogs search for their masters.

combat, though he bites cruelly when he finds himself seized by the hand of the hunter.

If, then, we consider this animal in a state of nature, or rather in a state of solitude and dispersion, he appears not, by his internal qualities, to rise above the other animals. He has not the genius of a dog, the sense of an elephant, the craftiness of the fox, &c., but is more remarkable for some singularities of external conformation, than for any apparent superiority of mental faculties. He is the only quadruped furnished with a flat, oval tail, covered with scales, which he uses as a rudder to direct his course in the water; the only animal that has his hind-feet webbed, and the toes of his fore-feet, which he employs for carrying victuals to his mouth, separate from each other; the only quadruped that resembles the land animals in the anterior parts of his body, and the aquatic animals in the posterior. He forms the link between quadrupeds and fishes, as the bat does between quadrupeds and birds. But these peculiarities would be rather defects than perfections, if the beaver knew not how to derive, from this singular conformation, advantages which render him superior to every other quadruped.

The beavers begin to assemble in the month of June or July, for the purpose of uniting into society. They arrive in numbers, from all corners, and soon form a troop of two or three hundred. The place of rendezvous is generally the situation fixed for their establishment, and is always on the banks of waters. If the waters be

flat, and never rise above their ordinary level, as in lakes, the beavers make no bank or dam. But, in rivers or brooks, where the waters are subject to risings and fallings, they build a bank, and, by this artifice, they form a pond, or piece of water, which remains always at the same height. The bank traverses the river, from one side to the other, like a sluice, and it is often from eighty to one hundred feet long, by ten or twelve broad at the base. This pile, for animals of a size so small, appears to be enormous, and supposes an incredible labour *. But the solidity with which the work is constructed, is still more astonishing than its magnitude. The part of the river where they erect this bank is generally shallow. If they find on the margin a large tree, which can be made to fall into the water, they begin with cutting it down, to form the principal part of their work. This tree is often thicker than the body of a man. By gnawing the foot of the tree with their four cutting teeth, they accomplish their purpose in a very short time, and always make the tree fall across the river. They next cut the branches from the trunk, to make it lie level. These operations are performed by the whole community. Several beavers are employed in gnawing the foot of the tree, and others in lopping off the branches after it has fallen. Others, at the same time,

* The largest beavers weigh fifty or sixty pounds, and exceed not three feet in length, from the end of the muzzle to the origin of the tail.

traverse the banks of the river, and cut down smaller trees, from the size of a man's leg to that of his thigh. These they dress, and cut to a certain length, to make stakes of them, and first drag them by land to the margin of the river, and then by water to the place where the building is carrying on. These piles they sink down, and interweave the branches with the larger stakes. This operation implies the surmounting of many difficulties; for, to dress these stakes, and to put them in a situation nearly perpendicular, some of the beavers must elevate, with their teeth, the thick ends against the margin of the river, or against the cross-tree, while others plunge to the bottom, and dig holes with their fore-feet, to receive the points, that they may stand on end. When some are labouring in this manner, others bring earth, which they plash with their feet, and beat firm with their tails. They carry the earth in their mouths, and with their fore-feet, and transport it in such quantities, that they fill with it all the intervals between the piles. These piles consist of several rows of stakes, of equal height, all placed opposite to each other, and extend from one bank of the river to the other. The stakes facing the under part of the river are placed perpendicularly; but the rest of the work slopes upwards, to sustain the pressure of the fluid; so that the bank, which is ten or twelve feet wide at the base, is reduced to two or three at the top. It has, therefore, not only all the necessary thickness and solidity, but the most advantageous form for supporting the weight of the

water, for preventing its issue, and to repel its efforts. Near the top, or thinnest part of the bank, they make two or three sloping holes, to allow the surface-water to escape, and these they enlarge or contract, according as the river rises or falls; and, when any breaches are made in the bank by sudden or violent inundations, they know how to repair them as soon as the water subsides.

It would be superfluous, after this account of their public work, to give a detail of their particular operations, were it not necessary, in a history of these animals, to mention every fact, and were not the first great structure made with a view to render their smaller habitations more commodious. These cabins or houses are built upon piles near the margin of the pond, and have two openings, the one for going to the land, and the other for throwing themselves into the water. The form of the edifices is either oval or round, some of them larger and some less, varying from four or five, to eight or ten feet diameter. Some of them consist of three or four stories; and their walls are about two feet thick, raised perpendicularly upon planks, or plain stakes; which serve both for foundations and floors to their houses. When they consist but of one story, the walls rise perpendicularly a few feet only, afterwards assume a curved form, and terminate in a dome or vault, which serves them for a roof. They are built with amazing solidity, and neatly plastered both without and within. They are impenetrable to rain, and resist the most impo-

tuous winds. The partitions are covered with a kind of stucco, as nicely plastered as if it had been executed by the hand of man. In the application of this mortar, their tails serve for trowels, and their feet for plashing. They employ different materials, as wood, stone, and a kind of sandy earth, which is not subject to be dissolved in water. The wood they use is almost all of the light and tender kinds, as alders, poplars, and willows, which generally grow on the banks of rivers, and are more easily barked, cut, and transported, than the heavier and more solid species of timber. When they once attack a tree, they never abandon it till they cut it down, and carry it off. They always begin the operation of cutting at a foot or a foot and a half above the ground: they labour in a sitting posture; and, beside the convenience of this situation, they enjoy the pleasure of gnawing perpetually the bark and wood, which are most palatable to their taste; for they prefer fresh bark and tender wood to most of their ordinary aliment *. Of these provisions they lay up ample stores, to support them during the winter †; but

* "In Europe, the favourite food of the beaver is the bark of the poplar, the aspin, the birch, and other soft woods. In America, the magnolia glauca and the Fraxinus Americana are said to be particularly selected. It also feeds on various roots, and especially on those of the Acorus calamus, or Calamus aromaticus." — *Shaw's Gen. Zool.* ii. p. 40.

W.

† The provision for eight or ten beavers, is twenty-five or thirty feet in length, by eight or ten feet in thickness. They transport not into their cabins wood or bark, till cut into thin slices, and just prepared for eating. They love fresh wood

they are not fond of dry wood. It is in the water, and near their habitations, that they establish their magazines. Each cabin has its own magazine, proportioned to the number of its inhabitants, who have all a common right to the store, and never pillage their neighbours. Some villages are composed of twenty or twenty-five cabins. But these large establishments are rare; and the common republic seldom exceeds ten or twelve families, of which each has his own quarter of the village, his own magazine, and his separate habitation. They allow not strangers to set down in their neighbourhood. The smallest cabins contain two, four, or six; and the largest eighteen, twenty, and, it is alleged, sometimes thirty beavers. They are almost always equally paired, being the same number of females as of males. Thus, upon a moderate computation, the society is often composed of 150 or 200, who all, at first, laboured jointly, in raising the great public building, and afterwards in select tribes or companies, in making particular habitations. In this society, however numerous, an universal peace is maintained. Their union is cemented by common labours; and it is rendered perpetual by mutual convenience, and the abundance of provisions which they amass and consume together. Moderate appetites, a simple taste, an aversion to blood and carnage, deprive them of the idea of rapine and war. They enjoy

better than what has been floated, and go out, from time to time, during the winter, to eat fresh provisions in the forests. —*Mem. de l'Acad.* ann. 1704.

every possible good, while man knows only how to pant after happiness. Friends to each other, if they have some foreign enemies, they know how to avoid them. When danger approaches, they advertise one another, by striking their tail on the surface of the water, the noise of which is heard at a great distance, and resounds through all the vaults of their habitations. Each takes his part; some plunge into the lake, others conceal themselves within their walls, which can be penetrated only by the fire of heaven, or the steel of man, and which no animal will attempt either to open or to overturn. These retreats are not only very safe, but neat and commodious. The floors are spread over with verdure; the branches of the box and the fir serve them for carpets, upon which they permit not the smallest dirtiness. The window that faces the water answers for a balcony to receive the fresh air, and to bathe. During the greatest part of the day, they sit on end, with their head and anterior parts of the body elevated, and their posterior parts sunk in the water. This window is made with caution, the aperture of which is sufficiently raised to prevent its being stopped up with the ice, which, in the beaver climates, is often two or three feet thick. When this happens, they slope the sole of the window, cut obliquely the stakes which support it, and thus open a communication with the unfrozen water. This element is so necessary, or rather so agreeable to them, that they can seldom dispense with it,

They often swim a long way under the ice: it is then that they are most easily taken, by attacking the cabin on one hand, and, at the same time, watching at a hole made at some distance, where they are obliged to repair for the purposes of respiration. The continual habit of keeping their tail and posterior parts in the water, appears to have changed the nature of their flesh. That of their anterior parts, as far as the reins, has the taste and consistence of the flesh of land or air animals; but that of the tail and posteriors has the odour and all the other qualities of fish. The tail, which is a foot long, an inch thick, and five or six inches broad, is even an extremity or genuine portion of a fish attached to the body of a quadruped: it is entirely covered with scales, and with a skin perfectly similar to that of large fishes. The scales may be scraped off with a knife, and, after falling, they leave an impression on the skin, which is the case with all fishes.

It is in the beginning of summer that the beavers assemble. They employ the months of July and August in the construction of their bank and cabins. They collect, in September, their provisions of bark and wood: afterwards they enjoy the fruits of their labours, and taste the sweets of domestic happiness. This is the time of repose, and the season of love. Knowing and loving one another from habit, from the pleasures and fatigues of a common labour, each couple join not by chance, nor by the pressing necessities of nature, but unite from choice and from taste.

They pass together the autumn and the winter: perfectly satisfied with each other, they never separate. At ease in their cabins, they go not out but upon agreeable or useful excursions, to bring in supplies of fresh bark, which they prefer to what is too dry or too much moistened with water. The females are said to continue pregnant four months; they bring forth in the end of winter, and generally produce two or three at a time. About this period they are left by the males, who retire to the country to enjoy the pleasures and the fruits of the spring. They return, occasionally, to their cabins; but dwell there no more. The mothers continue in the cabins, and are occupied in nursing, protecting, and rearing their young, which, at the end of a few weeks, are in a condition to follow their dams. The females, in their turn, make little excursions to recruit themselves by the air, by eating fishes, crabs, and fresh bark, and, in this manner, pass the summer upon the waters, and in the woods. They assemble not again till autumn, unless their banks or cabins be overturned by inundations; for, when accidents of this kind happen, they suddenly collect their forces, in order to repair the breaches which have been made.

Some places they prefer to others for their habitation, and they have been observed, after having their labours frequently destroyed, to return every summer to repair them, till, being fatigued with this persecution, and weakened by the loss of several of their numbers, they took the resolu-

tion of changing their abode, and of retiring to solitudes still more profound. It is in winter that they are chiefly sought by the hunters; because their fur is not perfectly sound in any other season: and, after their village is ruined, and numbers of them are taken, the society is sometimes too much reduced to admit of a fresh establishment; but those which escape death or captivity disperse and become vagabond. Their genius, withered by fear, never again expands. They hide themselves, and their talents, in holes; or, sunk to the condition of other animals, they lead a timid and a solitary life. Occupied only by pressing wants, and exerting solely their individual powers, they lose for ever those social qualities which we have been so justly admiring *.

However marvellous the society and the operations I have now described may appear, it is im-

* The hunters, who are sensible that these creatures love green wood better than old, place a parcel of the former about their lodge, and then have several devices to ensnare them. Sometimes they are taken in long traps, baited with poplar sticks, laid in a path near the water; and so delicate is the beaver's sense of smelling, that unless the Indians wash their hands before they bait the traps, the sagacious animal is sure to shun the snare. When the winter grows severe, they sometimes break the ice; and when the beavers come to the opening, for the benefit of the fresh air, they kill them with hatchets; or make a large aperture in the ice, and cover it with a very strong net, and then overturn the lodge, upon which the beavers, who think to escape in their usual way, by flying to the water and emerging at the hole in the ice, fall into the snare, and are taken.

W.

possible to doubt of their reality. All the facts mentioned by numbers of eye-witnesses * correspond with those I have related: and, if my narration differ from some which have been given, it is only in a few points that I judged too marvellous and improbable to be credited. Authors have not limited themselves to the social manners of the beavers, and to their evident talents for architecture, but have ascribed to them general ideas of police and of government. They have affirmed, that, after the beavers have established a society, they reduce strangers and travellers of their own species into slavery; that these they employ to carry their earth and to drag their trees; that they treat in the same

* See concerning the history of the beavers, Olaüs Magnus dans sa Description des Pays Septentrionaux; les Voyages du Baron de la Hontan, tom. ii. p. 155, et suiv. Musæum Wormianum, p. 320; l'Histoire de l'Amérique Septéntrionale par Bacqueville de la Poterie, Rouen, 1722, tom. i. p. 133; Mémoire sur le Castor, par M. Sarrasin, inséré dans les Mémoires de l'Academie des Sciences, ann. 1704; la Relation d'un Voyage en Acadie, par Dierville, Rouen, 1708, p. 126, et suiv. les Nouvelles, Découvertes dans l'Amérique Septentrionale, Paris, 1697, p. 133; l'Histoire de la Nouvelle France, par le P. Charlevoix, Paris, 1744, tom. ii. p. 98, et suiv. le Voyage de la Robert Lade, traduit de l'Anglois par M. l'Abbé Prevost, tom. ii. p. 226; le Grand Voyage au Pays des Hurons, par Sagard Theodat, Paris, 1632, p. 319, et suiv. le Voyage à la Baie de Hudson, par Ellis, Paris, 1749, tom. ii. p. 61 et 62. Voyez aussi Gesner, Aldrovande, Johnston, Klein, &c., à l'Article du Castor; le Traité du Castor par Jean Marius, Paris, 1746; l'Histoire de la Virginie, traduite de l'Anglois, Orléans, 1707, p. 406; l'Histoire Naturelle du P. Rzaczynsky, à l'Article du Castor, &c. &c.

manner the lazy and old of their own society; that they turn them on their backs, and make them serve as vehicles for the carriage of their materials; that these republicans never associate but in an odd number, in order to have always a casting voice in their deliberations; that each tribe has its chief; that they have established sentinels for the public safety; that, when pursued, they tear off their testicles to satisfy the avarice of their hunters; that, in this mutilated state, they exhibit themselves to procure compassion from their persecutors *, &c. In proportion as we reject with contempt those exaggerated fables, we must admit the facts which are established and confirmed by moral certainties. The works of this animal have been a thousand times viewed, measured, overturned, designed, and engraven. What is still more convincing, some of these singular works still subsist, though less common than when North America was first discovered, and have been seen by all the missionaries, and all the latest travellers who have penetrated into the northern regions of that continent.

It is universally agreed, that, beside the beavers who live in society, there are, in the same climate, others who are solitary, and rejected, it is said, from the social state for their crimes, reaping none of its advantages, having neither house nor magazine, and living, like the badger, in holes under the ground. These solitary beavers are

* See Ælian, and all the ancients, except Pliny, who, like a philosopher, denies the fact. For the other articles, see most of the authors quoted in the preceding note.

called *terriers*. They are easily distinguished by their dirty and tattered robe; for the hair of their back is rubbed off by the friction of the earth. They live, like the other kind, upon banks of waters, where some of them make a ditch of several feet deep, in order to form a pond that may reach to the mouth of their hole, which frequently exceeds 100 feet in length, and all along slopes upward, to facilitate their retreat, in proportion as the water rises during inundations. But there are other solitary beavers, which live at a considerable distance from water. All our European beavers are terriers and solitary, and their fur is not nearly so valuable as that of those which live in society. They differ in colour according to the climate they inhabit. In the northern deserts, they are perfectly black, and their furs are finest; but, even there, some are found entirely white, others white spotted with gray, and others with a mixture of red upon the nap of the neck and haunches *. In proportion as they recede from the north, their colour turns clearer and more mixed. In the north of Canada they are chesnut coloured; farther south, they are bay, and of a pale straw colour among the Ilionois †. In America, beavers are found from the thirtieth degree of north latitude to beyond the sixtieth. They are very frequent in the north, and gradually decrease as we advance southward. The

* Castor albus, cauda horizontaliter plana.—*Brisson. Regn. Anim.* p. 94.

† Hist. de la Nouvelle France, par le P. Charlevoix, tom. ii. p. 94.

same thing holds in the Old Continent: they never appear in numbers but in the northern regions *; and they are very rare in France, Spain, Italy, Greece, and Egypt. They were known to the ancients. The religion of the Magi prohibited the killing of beavers. They were common on the margins of the Pontus Euxinus, and were distinguished by the name of *Canes Pontici*: but they probably were not quiet enough in this situation (for the coasts of this country have been frequented by men from the earliest periods of history), since their society and labours are mentioned by none of the ancients. Ælian, in particular, who betrays so strong an affection for the marvellous, and who, I believe, first said that the beaver cut off his testicles to allow them to be collected by the hunters †, would never have failed to mention the wonders of their republic, and their talents for architecture. Even Pliny himself, whose bold, sublime, and melancholy genius, made him uniformly despise men to exalt Nature, could not have abstained from comparing the labours of Romulus to those of the beavers. It is therefore apparent, that their industry in build-

* According to the observations of professor Pallas, their number is extremely diminished even in the northern regions. They were formerly abundant on the banks of the Samara, in Tartary; but at present they are rare, being almost entirely destroyed by the Cossacks. Numbers still remain in Siberia, in the rivers beyond the Yenissei, where they form their societies in places far distant from the habitation of man. *W.*

† Hist. Anim. lib. vi. cap. 34.

ing was altogether unknown to the ancients; and, although cabined beavers have lately been found in Norway, and in other northern regions of Europe, and though it is probable that the ancient beavers built as well as the modern; yet, as the Romans never penetrated so far north, it is not surprising that their writers are silent on this subject.

Several authors have affirmed, that the beaver, being an aquatic animal, could not live upon land, without water. But this notion is false; for the young beaver sent me from Canada was always kept in the house; and, when first presented to water, was afraid, and refused to enter into that element. But, after being forced, and retained in a bason, he grew so easy in a few minutes, that he made no attempts to get out; and, when left at liberty, often returned to the water spontaneously. He likewise availed himself of the mire and moist pavements. One day he escaped, and descended by a stair into the subterraneous vaults in the royal garden. He continued for some time to swim in the stagnant water in the bottom of these vaults. However, as soon as he saw the light of the torches which were brought to search for him, he returned to those who called him, and allowed himself quietly to be taken. He is familiar, without being caressing: he asks to eat from those who are at table; and his petitions consist of a small plaintive cry, and some gestures with his hand. When he receives a morsel, he carries off and conceals it, to be eaten at leisure. He sleeps pretty often,

reposing on his belly. He eats every thing, except flesh, which he constantly refuses, whether it be raw or roasted. He gnaws every thing he can find, stuffs, furniture, wood, &c.; and we have been obliged to line, with a double coat of tinned iron, the barrel in which he was transported *.

Beavers may be easily tamed, and even taught to fish, and to bring home their prey to the family. M. Kalm assures us of this fact:

"I have seen, in America," says he, "beavers so fully tamed, that, when sent out to fish, they brought home the booty to their master. I have also seen others which were so familiar with their masters, and with the dogs, that they followed

* There are two beavers in the collection of beasts at Exeter Change, which were brought from Canada about the year 1800. They appeared, when last I saw them, to be healthy, and were so perfectly tame that the keeper took them in his arms without the least hesitation. They are fed on bread, greens, and fresh-water fish. At my request the keeper gave them some bread, which they took with their fore-feet, rising almost upright upon their hind-legs for that purpose, and at the same time making a plaintive noise, like the faint crying of a young child. They feed in the posture of a rat, holding the bread firmly between their paws till the whole is consumed. The two animals differ in depth of colour, one being of a much darker brown than the other, though in both the hair becomes lighter towards the tail and belly. These harmless creatures, although confined so long in a space less than six feet square, have not forgotten their old instinctive habits, but busy themselves in peeling the bark from a few willow branches which the keeper occasionally throws into a trough of water for their use.

W.

them, accompanied them in the boats, jumped into the water, and, in a moment after, returned with a fish *."

"We have seen," says M. Gmelin, "in a small village of Siberia, a beaver that was brought up in the house, and was so exceedingly tractable, that he sometimes made voyages to a considerable distance, decoyed females, and brought them home; after the season of love was over, these females returned without any conductor †."

Though the beavers prefer the margins of lakes, rivers, and other fresh waters; yet they are found on the sea-coasts, but principally on mediterranean gulfs which receive great rivers, where the water has not its usual saltness. They are hostile to the otter, whom they chase, and will not permit to appear in the waters they frequent. The fur of the beaver is finer and more bushy than that of the otter: it consists of two kinds of hair; the one, which is short, but bushy, fine as down, and impenetrable by water, immediately covers the skin; the other, which is longer, firmer, more splendid, but thinner, serves the former as a surtout, defending it from dust and dirt. This second kind of hair is of little value; it is the first alone that is employed in our manufactures. The black furs are generally most bushy, and consequently in greatest esteem. The fur of the terrier beaver is much inferior to that of the

* Voyage de Kalm, tom. ii. p. 350.

† Voyage de Kamtschatka, p. 73.

cabin building kind. The beavers, like all other quadrupeds, cast their hair in summer; and the furs of those caught during this season are of little value. The fur of the white beaver is greatly esteemed, on account of its rarity; and the perfectly black furs are nearly as rare as the white *.

But, beside the fur, which is the most precious article, the beaver furnishes a matter, of which great use has been made in medicine. This matter, called *castoreum*, is contained in two large bags or bladders, which the ancients mistook for the testicles of the animal. We shall here give neither the description nor the uses of that sub-

* The Americans used to strip the long hair from the beavers' skin, and manufacture the down into stockings, caps, and stuffs; but these have been found liable to harden like felt, and are therefore disused in most places; so that at present the beaver is used for little else than hats or furs. According to Mr. Pennant, the manufacture of hats from the fur of these animals began in the reign of Charles the First, when the manufacture was regulated, 1638, by proclamation; in which is an express prohibition of using any materials except *beaver-stuff* or *beaver-wool*; and the hats called demi-castors were forbidden to be made, unless for exportation. Since that time the demand for furs has become so great, that the imports from America into the ports of London and Rochelle, of beaver skins *alone*, as far back as the year 1743, was,

Into the port of London . .	26,750
Into Rochelle	127,080
	153,830

In 1763, we imported more than double the number, 54,670 skins being sold in a single sale of the Hudson's Bay Company. *W.*

stance *, because they are to be found in all our dispensatories †. The savages, it is said, extract an oil from the tail of the beaver, and use it as a topical application for several diseases. The flesh of the beaver, though fat and delicate, has always a disagreeable flavour. Their bones are said to be excessively hard; but, concerning this fact, we have had no opportunities of determining, because we dissected only a young one. Their teeth are very hard, and so sharp, that they are used by the savages as knives to cut, hollow, and polish their timber. The savages clothe themselves with beavers' skins; and, in winter, turn the shaggy side inward; and these, from their having imbibed much sweat from the perspiration of their wearers, are called *fat-beaver*, or *coat-beaver*, and are employed for coarse works only.

The beaver uses his fore-feet, like hands, with equal dexterity as the squirrel, the toes being well separated; but those of the hind-feet are united by a membrane. These they employ as fins, and extend them like the toes of a goose, which animal they resemble in their walking upon land. The beaver swims better than he runs: as his fore-legs are much shorter than the hind ones, he always walks with his head low, and his back arched. His senses are extremely

* See Le Traité du Castor, par Marius et Francus.

† It is alleged that the beavers press out this liquor with their feet, that it restores their appetite after a disgust, and that the savages rub the snares with it which they lay for apprehending these animals. It is more certain, however, that they use this liquor for greasing their hair.

delicate, especially the sense of smelling. Dirtiness and bad smells seem to be perfectly unsupportable to him. When retained in confinement too long, and obliged to void his excrements, he places them near the threshold of the door, and, as soon as it is opened, he pushes them out. This habit of cleanliness is natural to them; and our young beaver never failed, in this manner, to clean his habitation. At the age of twelve months, he exhibited marks of ardour for a female, which renders it probable that he had then nearly attained his full growth. Hence the duration of life in these animals cannot be very long; perhaps it is too much to extend it to fifteen or twenty years. It is not astonishing that this beaver was smaller than others of his age, having been perpetually confined almost from his birth; and, being unacquainted with water till he was nine months old, he could neither grow nor expand like those who enjoy liberty, and the use of that element, which appears to be equally necessary to them as the land.

54 H

RACCOON.

THE RACCOON*.

SEVERAL authors have described this animal under the name of *Coati*. But, to prevent its being confounded with the true *Coati*, or even

* CHARACTER SPECIFICUS †.

URSUS LOTOR. U. cauda annulata, fascia per oculos transversali nigra. — *Linn. Syst. Nat. Gmel.* i. p. 103. — *Schreb.* iii. p. 521, pl. 143.

Ursus cauda annulatim variegata. — *Briss. Quadr.* p. 189.

Vulpi affinis Americana. Coati Brasiliensibus. — *Ray's Quadr.* p. 179. — *Catesb. Carol. App.* p. 29.

MAPACH. — *Fernand. Anim.* No. 2, p. 1. — *Jonst. Quadr.* t. 74.

LE RATON. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 129, pl. 5, fig. 2.

RACCOON. — *Penn. Hist. Quadr.* ii. p. 12. — *Shaw's Gen. Zool.* i. p. 464, pl. 105.

HABITAT

in Americæ maritimis. *W.*

This animal has a black sharp pointed nose; upper jaw longer; ears short, and rounded; eyes surrounded with two broad patches of black; from the forehead to the nose a dusky line; face, cheeks, and chin, white; upper part of the

† For the generic character, see the Bear.

W.

with the *Coati-mondi*, we have adopted its English name.

The raccoon which we have had alive, and kept him twelve months, was of the size and figure of a small badger. His body is thick and short, and the hair long, bushy, black at the points, and gray underneath. His head resembles that of the fox; but his ears are round and much shorter. The eyes are large, and of a yellowish green colour. Above the eyes, a black band runs across; the muzzle is slender, the nose somewhat turned up, and the upper lip advances beyond the under one. He has, like the dog, six cutting teeth, and two canine in each jaw. The tail is bushy, as long as the body, and marked alternately with black and white rings through its whole extent. The fore-legs are much shorter than the hind ones; and there are five toes, armed with strong sharp claws, on each foot. The hind-feet rest so much on the heel, that the animal can elevate and support his body in a position inclining forwards. He uses the fore-feet in carrying food to his mouth. But, as his toes are rigid, and have little flexibility, he uses both hands at a time in laying hold of what is given him. Though thick and short, he is very agile: his claws, which are sharp as thorns, enable him to climb trees with great facility. He mounts the trunk with alacrity, and runs to the

body covered with hair, ash coloured at the root, whitish in the middle, and tipt with black; tail very bushy, annulated with black; toes black, and quite divided. — *Penn. Synops. Quadr.* p. 199.

extremities of the branches. He goes by leaps, rather gambols than walks, and his movements, though oblique, are quick and light.

This animal is a native of the southern parts of America. He is never found in the Ancient Continent; at least, those travellers who have described the animals of Africa and the East Indies make no mention of him. But he is very common in the warm regions of America, and particularly in Jamaica *, where he lives in the mountains, from which he descends to eat the sugar canes. He appears not in Canada, nor in the northern parts of the continent; and yet he can support excessive cold. M. Klein † kept one at Dantzick; and the one in my possession has passed a whole night with his feet frozen in ice, without suffering any injury.

The raccoon softens, or rather dilutes, in water every thing he intends to eat. He throws his bread into the bason that holds his water; and, unless pressed with hunger, he does not remove it till it be well soaked. But, when very hungry, he eats dry food, or any thing that is presented to him. He searches about, and eats every thing that he can find, as flesh, either crude or prepared, fishes, eggs, living fowls, grain, roots, &c. He likewise devours all kind of insects. He delights in hunting spiders; and, when at liberty in the garden, he eats grasshoppers, snails, and worms. He loves sugar, milk, and other soft kinds of nourishment, except fruits; but

* Sloan's Nat. Hist. of Jamaica, tom. ii. p. 329.

† Klein, Quad. p. 62.

all these he rejects, when he can have flesh or fish. He retires to a distance to obey the calls of nature. He is familiar, and even caressing; for he leaps upon those he is fond of, playing spontaneously, and perpetually moving about with great agility. He appears to have much of the nature of the maki, and to possess some of the qualities of the dog*.

Concerning the raccoon, I have received the following communication from M. Blanquart des Salines, in a letter dated Calais, October 29, 1775.

"My raccoon, before he came into my possession, had always been chained. In this state of captivity, he was very gentle, but had little inclination to caress. The people of the house

* There is something very laconic in Pennant's account of this animal:

"Inhabits the warm and temperate parts of America: found also in the mountains of Jamaica, and in the isles of Maria, between the south point of California and Cape Corientes, in the South Sea: an animal easily made tame; very good natured and sportive, but as unlucky as a monkey; almost always in motion; very inquisitive, examining every thing with its paws; makes use of them as hands: sits up to eat, is extremely fond of sweet things and strong liquors, and will get excessively drunk: has all the cunning of a fox: very destructive to poultry; but will eat all sorts of fruits, green corn, &c.: at low water, feeds much on oysters; will watch their opening, and with its paw snatch out the fish: sometimes is caught in the shell, and kept there till drowned by the coming in of the tide: fond also of crabs: climbs very nimbly up trees: hunted for its skin; the fur, next to that of the beaver, being excellent for making hats." — *Penn. Hist. Quadr.* ii. p. 12. *W.*

were all equally kind to him; but he received them differently; for what pleased him in one, he revolted against in another; and in this his conduct was invariable.

"His chain sometimes broke; and liberty rendered him insolent. He took possession of an apartment, would allow none to enter, and it was with some difficulty that he could again be reconciled to bondage. Since he came under my management, I have frequently given him his liberty. Without losing sight of him, I allowed him to walk about with his chain; and each time his gratitude was expressed by a thousand caressing gambols. But this is by no means the case when he makes his escape himself. He then roams about, sometimes for three or four days together, upon the roofs of the neighbouring houses, descends, during the night-time, into the court-yards, enters the hen-houses, strangles all the poultry, and eats their heads. His chain does not render him more humane, but only more circumspect. He then employs every artifice to make the fowls grow familiar with him; he permits them to partake of his victuals; and it is only after having inspired them with the highest notions of security, that he seizes one, and tears it in pieces. Some young cats have met with the same fate. The motions of this animal, though light, are always oblique; and I doubt if he can overtake other animals by running. He opens oysters with wonderful dexterity. His sense of touching must be exquisite. In all his little operations, he seldom

uses either his nose or his eye. For example, he makes an oyster pass under his hind-paws; then, without looking at it, he searches with his hands for the weakest part; there he sinks his claws, separates the shells, and leaves not a vestige of the fish. In all this operation, neither his eyes nor his nose, which he keeps at a distance, are of the least use to him.

"This raccoon is not very grateful for the caresses he receives; but is extremely sensible of bad treatment. A servant one day gave him several lashes with a whip. But this man has ever since endeavoured in vain to accomplish a reconciliation. Neither eggs nor fishes, of which the animal is exceedingly fond, can appease his resentment. At the approach of the servant, the raccoon flies into a rage; his eyes kindle; he springs at the man, utters most dolorous cries, and rejects every thing presented to him, till the disagreeable object disappears. The accents of his rage are very singular, sometimes resembling the whistling noise of the curlew, and sometimes the hoarse barking of an old dog.

"If any person strikes him, or if he is attacked by an animal that he thinks stronger than himself, he makes no resistance: but, like the hedgehog, conceals his head and feet, by rolling up his body in the form of a ball; no complaint escapes him; and, in this position, he calmly submits to be killed.

"I remarked, that he never allowed hay or straw to remain in his nest; but chose rather to lie upon wood. When litter is put in, he in-

stantly throws it out. I never perceived that cold made him uneasy. Of three winters, he has passed two exposed to all the rigours of the air. I have seen him covered with snow, having no shelter, and yet in good health. I imagine that he is not solicitous about heat. During the last frosts, I presented to him warm water, and water almost frozen, for diluting his food; but he uniformly preferred the latter. He had liberty of sleeping in the stable; but he often preferred a corner of the court.

"The defect of saliva, or having but a small quantity of it, is, I imagine, the reason why this animal dilutes his food with water. He never wets fresh or bloody meat, nor a peach nor a raisin. But he plunges every thing that is dry into his bason.

"He abhors children; their crying irritates him; and he makes every effort to spring upon them. A small bitch, of which he is fond, he chastises severely when she barks too loud. I know not why several animals equally detest sharp cries. In the year 1770, I had five white mice. I happened to make one of them cry; the others attacked it: I continued to make it cry; and they killed it.

"This raccoon is a female; she comes in season in the beginning of summer, and her ardour for the male continues six weeks. During this period, nothing can quiet her; every object is disgusting; and she hardly takes nourishment. A hundred times each day she passes, between her thighs and between her fore-feet, her bushy

tail, which she seizes by the end with her teeth, and agitates perpetually, to give friction to the parts.

"This animal acquires not its full growth till it be two years and a half old *."

* It must be observed, that the note which the count has subjoined (from the seventh volume of the Transactions of the Swedish Academy) to the end of the Coati, concerns the raccoon, and not that animal.

W.

2A

Plate 158

Warner Sc

CRAB-EATING RACCOON.

THE CRAB-EATER RACCOON*.

WE have given the figure of an animal sent us from Cayenne, by M. de la Borde, under the improper name of dog-crab-eater: it agrees with the crab-eater only in its choice of food, but it greatly resembles the raccoon in its size, the shape and proportion of its head, its body, and its tail. Being ignorant of the name it bears in its native country, we have called it (in conformity to our information) the crab-eater raccoon, to distinguish it from the raccoon and the crab-eater, both of which are figured in this work.

This animal was sent from Cayenne with the following denomination: "Dog-crab-eater, adult; female, taken while suckling three young ones." But, as we have said before, it has no apparent analogy to the crab-eater, neither in the shape of its body, nor in having a scaly tail; its length, from the end of the muzzle to the origin of the tail, is twenty three inches and a half, and consequently is nearly the same as that of the raccoon, which is twenty two inches and a half; the other

* Ursus Cancrivorus.—*Cuvier, Tabl. Elem. de l'Hist. Nat.* p. 113.

Le Raton-Crabier. — *Buff. Hist. Nat. par Sonn.* xxviii. p. 86. pl. 4. *W.*

dimensions are nearly equal in both animals, with the exception of the tail, which is much shorter and thinner in this species than in the raccoon.

This crab-eater raccoon is of a fawn colour mixed with black and gray; the black predominates on the head, the neck, and the back; but the fawn is without mixture on the sides of the neck and the body: the end of the nose and the nostrils are black; the extreme length of the whiskers is four inches; and the hairs above the angle of the eyes are two inches two lines; a blackish brown band surrounds the eyes and extends almost to the ears; it passes to the muzzle, and unites with the black on the top of the head: the ears, before, are edged with whitish hair, a band of the same colour is seen above the eyes, and there is a white spot in the middle of the forehead: the cheeks, the jaws, the under part of the neck, the breast, and the belly, are of a yellowish white; the legs and the feet are of a blackish brown: the fore-legs are covered with short hair; the toes are long, and separated from each other: there are six black rings on the tail, the intervals of which are of a grayish fawn colour. This again confirms a difference between this animal and the true raccoon, whose long tail, thick and tufted, is annulated only on its superior surface. These two species of raccoon also differ from each other in the colour of the hair, which, in the raccoon, is, on the body, a black mixt with gray and pale fawn colour, and whitish on the legs; on the contrary, in this, it is fawn colour mixt with black and gray on the

body, and blackish brown on the legs: thus, although these two animals resemble each other in several particulars, their difference appears to be sufficient to form two distinct species *.

* D'Azara mentions the crab-eater raccoon under the name of agouara-gouazou. He kept one alive three months, and gives the following account of its manners. — When any one approached, it growled and barked like a dog, but stronger: it lapped in drinking, and eat flesh both raw and cooked, previously tearing the same with its fore-feet: it passed its food but half digested, and we observed that it swallowed it again without any hesitation or repugnance: it was very fond of rats, small birds, sugar canes, and oranges; but I never saw it hunt poultry, or attack them, although they sometimes passed close to its door. *W.*

THE COATI, OR BRASILIAN WEESEL*.

THIS animal has been called *Coati-mondi* by several authors. We have had it alive; and, after comparing it with the coati mentioned by

* CHARACTER SPECIFICUS.

Viverra Nasua. V. rufa, cauda albo annulata, noso producto mobili.—*Linn. Syst. Nat. Gmel.* i. p. 86.—*Schreb.* iii. p. 436, pl. 118.

Ursus naso producto et mobili, cauda annulatim variegata.—*Briss. Quadr.* p. 190.

Vulpes minor, rostro superiore longiusculo, cauda annulatim ex nigro et rufo variegata.—*Barr. Hist. de la France, Equinox*, p. 167.

Coati.—*Marcgr. Bras.* p. 228.

Le Coati—*Buff. Hist. Nat. par Sonn.* xxvi. p. 141, pl. 5, fig. 1.

Brasilian Weesel.—*Penn. Hist. Quadr.* ii. p. 61, pl. 66.

Coati Mondi.—*Act. Paris*, t. 3, pt. 3, p. 17, t. 37.—*Shaw's Gen. Zool.* i. p. 385.—*Bew. Quadr.* p. 251.

HABITAT

in America: in Brasilia et Guiania. *W.*

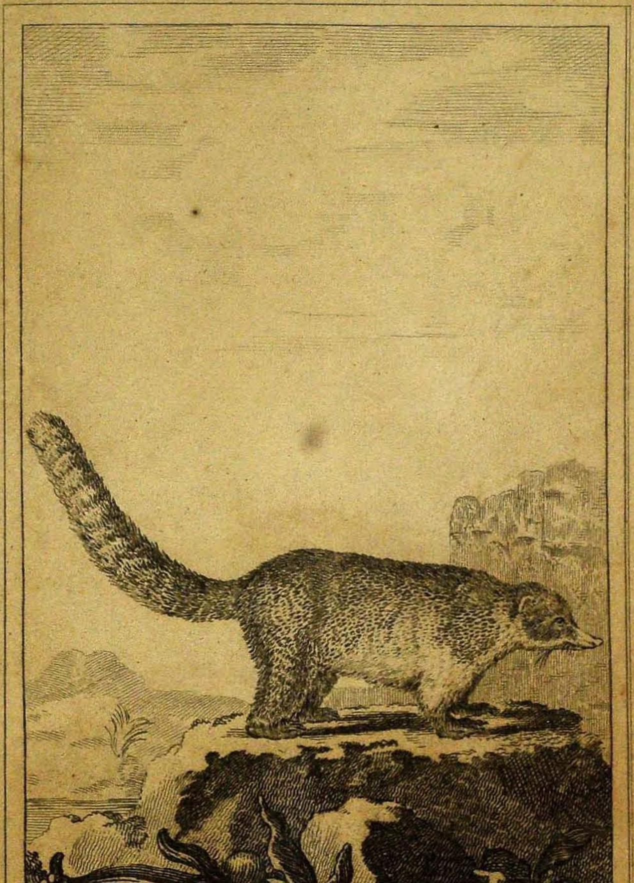
Weesel with the upper jaw lengthened into a pliant moveable proboscis, much longer than the lower jaw; ears rounded; eyes small; nose dusky; hair on the body smooth, soft, and glossy, of a bright bay colour; tail annulated with dusky and bay; breast whitish; length, from nose to tail, eighteen inches; tail thirteen inches.—*Penn. Synops. Quadr.* p. 229.

Plate 159

BLACK COATI.

16

Plate 160



BROWN COATI.

Thevet, and described by Marcgrave, we discovered the coati and coati-mondi to be only varieties of the same species; for Marcgrave, after describing the coati, says that there are other coati of a dark brown colour, called, for the sake of distinction, *coati-mondi* by the Brasilians. He admits not, therefore, any other difference between the coati and coati-mondi, but that of the colour of the hair; and hence they can be regarded as varieties only of the same species *.

The coati is very different from the raccoon described in the preceding article. He is of a smaller stature; his body and neck, head and muzzle, are much longer; the upper jaw is terminated by a kind of moveable snout, which stretches an inch, or an inch and a half, beyond the extremity of the under jaw. This turned up snout, joined to the length of the jaws, gives to the muzzle a curved and elevated appearance. The coati has also smaller eyes than the raccoon, shorter ears, longer, coarser, and less variegated hair, shorter legs and longer feet; and it rests still more upon the heel. Like the raccoon, it

* Most naturalists, in opposition to Pennant, who considers the two kinds of coati as varieties only, have agreed to form them into distinct species, under the names of *Viverra Nasua* and *Viverra Narica*. It must be noticed, however, that Cuvier, in his *Tableau Elementaire de l'Histoire Naturelle des Animaux*, while he makes the same distinction as Linnæus, Erxleben, and Gmelin, has removed the species from the genus Viverra to that of Ursus, retaining the specific names.

W.

has an annulated tail*, and five toes on each foot†.

Some authors regard the sow-badger as a coati, and have added to this genus the *taxus suillus* ‡, of which Aldrovandus has given a figure. But when it is considered, that the sow-badger mentioned by hunters is supposed to be found in France, and even in colder European climates, and that, on the contrary, the coati never appears but in the southern climates of the New Continent, this notion must be rejected, as having no foundation to support it §; for the figure given by Aldrovandus is nothing more than that of a badger, with the addition of a sow's snout. The author pretends not to have drawn this animal from nature; and he has not described it. The long muzzle and moveable snout sufficiently distinguish the coati from all other animals. Like the bear, the coati stands with ease on his hind-

* Some coatis have the tail of one uniform colour; but, as there are no other differences, they must be considered as varieties only, and not as distinct species.

† "There is a particularity," says Dr. Shaw, "sometimes observable in this animal, which seems worthy of notice, *viz.* a kind of prolongation of the skin at the back of the heel into several horny processes of about a quarter of an inch in length: these, in some specimens, are scarce visible. The tongue is marked on the upper part with several furrows, so disposed as to resemble the fibres of a leaf."

W.

‡ Briss. Regn. Anim. p. 263.

§ See what we remarked concerning the Taxus suillus, article Badger.

feet, resting upon his broad heels, which are terminated by large callosities, extending outward, and augmenting the base of the feet.

The coati has a trick of gnawing his own tail, which, when not mutilated, exceeds the length of the body; he generally carries his tail erect, and sweeps it about from side to side. This remarkable practice of gnawing the tail is not, however, peculiar to the coati; the monkeys, the *makis*, and some other animals which have long tails, shorten them one third, or one fourth, by eating both the flesh and the vertebræ. This circumstance gave rise to a general conclusion, that, in very long members, the extremities of which are, of course, removed to a distance from the centre of sensation, the feeling is weak, and that this weakness of feeling is proportioned to the distance and the thinness of the part; for, if the extremity of the tail, in those animals, was very sensible, the pain excited would be stronger than the desire of mutilation, and they would preserve their tails with equal anxiety as the other parts of their bodies. Upon the whole, the coati is an animal of prey, which lives upon flesh and blood, and which, like the fox or martin, devours small animals and fowls *, eats eggs, and hunts for the nests of birds †; and it is, probably, from this conformity of disposition, rather than from any resemblance to the martin, that the coati has been considered as a small species of the fox ‡.

* Marcgrave, Hist. Brasil, p. 228.

† Thevet, Singular. de la France Antarct. p. 96.

‡ In the seventh volume of the Transactions of the Swedish

Academy, we have the following remarks concerning the coati-mondi, by Linnæus, which we shall transcribe, without pretending to vouch his facts.

"This animal," says Linnæus, "is *equally* numerous both in *South* and in *North* America. In the length of his hind-legs, the inclination of his head, the bushiness of his hair, and in his paws, he resembles the bear. But he is small and familiar; and his tail is very long and variegated with different colours. The prince of Sweden made a present of one of these animals to Linnæus, who kept it a considerable time, but lost all the labour he bestowed in attempting to civilize it; for the coati-mondi, when it could slip into the court-yard, *violating all the rights of hospitality*, tore off the *heads* of the poultry, and *drank* their blood. It was so obstinate, that it would do nothing contrary to its inclination. Notwithstanding the smallness of this animal, he defended himself with great force, when any body attempted to seize him against his will; and he stuck fast to the legs of those with whom he was familiar, when he wanted to *ransack* their *pockets*, and carry off what he found in them. But there is a *remedy* for this *obstinacy*. The coati has an extreme aversion to hog's bristles; and the smallest *brush* makes him desert his enterprise. He was *one day* worried by a mastiff; and Linnæus *dissected* him. His mode of living was very singular. He slept from midnight till noon, waked the rest of the day, and uniformly walked about from six in the evening till midnight, without the least regard to the weather. This is probably the time assigned by Nature to this species of animals, when in their own country, for procuring their food, for hunting birds, and discovering their eggs, which constitute their principal nourishment." — *Biblioth. Raisonnée*, tom. xlix part 1. p. 25.

26 A

AGOUTI.

THE AGOUTI, OR LONG-NOSED CAVI *.

THIS animal is about the size of a hare, and has been regarded, by most systematic writers, as a species of rabbit, or large rat. These

* CHARACTER SPECIFICUS.

Cavia Aguti. C. caudata, corpore ex rufo fusco, abdomine flavescente. — *Linn. Syst. Nat. Gmel.* i. p. 121. — *Erxleb. Mamm.* p. 353. — *Schreb.* iv. p. 613, pl. 172.

Mus Aguti. M. cauda abbreviata, palmis tetradactylis, plantis tridactylis, abdomine flavescente. — *Syst. Nat.* ed. xii. i. p. 80, No. 2.

Cuniculus Agouti. C. caudatus, auritus, pilis ex rufo et fusco mixtis, rigidis vestitus. — *Briss. Quadr.* p. 143.

Mus sylvestris Americanus. — *Ray's Quadr.* p. 226.

Aguti, vel Acuti Brasiliensibus. — *Marcgr. Brasil*, p. 224. — *Jonst. Quadr.* pl. 63.

L'Agouti. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 153, pl. 5, fig. 2.

Long-nosed Cavy. — *Penn. Hist. Quadr.* ii. p. 94.

Agouti. — *Shaw's Gen. Zool.* ii. p. 24, pl. 126.

HABITAT

in Brasilia et Guiania. *W.*

Cavy, with a long nose; divided upper lip; short rounded lips; black eyes; hair hard and shining; on the body, mixed with red, brown, and black; on the rump, of a bright

animals, however, it resembles in some minute characters only; but, in natural dispositions, it differs essentially from them both. It has the rudeness of hair, the grunting, and likewise the voracious appetite of a hog; and, when fully glutted, it conceals, like the fox, the remainder of its food in different places. The agouti delights in cutting and gnawing every thing he meets with. When irritated, the hair of his back rises, and he strikes the ground forcibly with his hind-feet. His bite is cruel *. He digs not a hole like the rabbit, nor sits on the ground like the hare; but generally lives in the hollows of decayed trees. Fruits, potatoes, and manioc, are the common food of those which live near the habitations of men. But those which live in the woods and savannas feed upon leaves and roots, plants and shrubs. The agouti, like the squirrel, uses his fore-feet in holding his food, and carrying it to his mouth. He runs very nimbly both on plain and rising grounds. But, as his fore-legs are much shorter than his hind-legs, he would tumble headlong, if he did not slacken his course in descending. Both his eye and his ear are fine,

orange colour; belly yellow; legs almost naked, slender, and black; four toes on the fore-feet, three on the hind; tail short, and naked; size of a rabbit. — *Penn. Synops. Quadr.* p. 245.

* This animal is very mischievous: the capuchins of Olinda in Brasil brought up a young one, and used the precaution of extracting his teeth; yet he continued to extend his devastations as far as his chain allowed him. — *Hist. des Indes par Souchu de Rennefort*, p. 203.

He stops and listens to the sound of music. The flesh of those which are fat and well fed is not very bad, though it be hard, and not very agreeable to the taste. They scald the agouti, and make him ready, in the same manner as a pig. He is hunted with dogs. When forced among the cut sugar canes, he is soon taken; because these grounds being generally covered a foot thick with straw and leaves, at each leap he sinks in this litter, so that a man may overtake and slay him with a stick. He commonly runs very nimbly before the dogs; and, when he gains his retreat, he lies squat, and remains obstinately in his concealment. The hunters are obliged to chase him out by filling his hole with smoke: the animal, half suffocated, utters mournful cries; but never issues forth, unless when pushed to the last extremity. His cry, which he often repeats when disturbed or irritated, resembles that of a small hog. If taken young, he is easily tamed, and goes out and returns of his own accord. These animals commonly reside in the woods and hedges; where the females choose a place well covered and bushy, and there prepare a bed of leaves and hay for their young. They annually produce two or three, but generally two *. Like the cats, they transport their young, two or three days after birth, into the hollows of trees, where they suckle them for a short time. The young are soon in a condition

* Hist. Gen. des Isles Antilles, par le Pere du Tertre, tom. ii. p. 296.

to follow their mother, and to search for food. Thus their time of growth is short; and, consequently, the duration of their lives cannot be long.

M. de la Borde informs us, that, in Guiana, it is the most common quadruped; all the woods, plains, heights, and even the marshes, being full of these animals *.

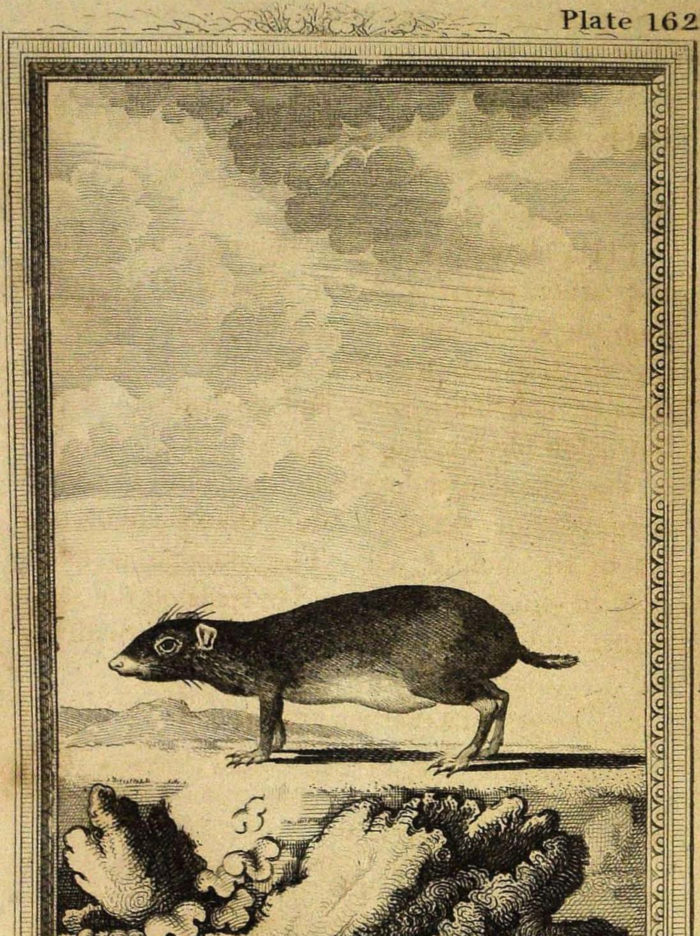
"The agouti," says he, "is about the size of a hare; his skin is hard, and lasts very long when employed as an upper-leather to shoes. He has no grease: his flesh is as white, and nearly as good, as that of the rabbit, having the same taste and flavour. Whether old or young, their flesh is always tender; but those which inhabit the sea-coast are best. They are taken in traps, or hunted with dogs. The Indians and Negroes, who know how to allure them by whistling, or imitating their cries, kill as many of them as they please. When pursued, they conceal themselves, like the rabbits, in the holes of old trees. They hold their food in their paws, like the squirrels. Their ordinary food, which they often conceal in the earth, to be used occasionally, are the nuts of the maripa, of the tourlovri, of the corana, &c.; and, after concealing these nuts, they often touch them not for six months. They multiply as fast as the rabbits, producing three, four, and sometimes five young

* Sonnini says that, in the island of Cayenne, the agouti is the most common kind of game, and that the epicures prefer the flesh of those taken in the island, to what are caught on the continent. W.

ones, during every season of the year. They live not in numbers in the same hole; but they are either found alone, or the mother with her young. They are easily tamed, and eat almost every thing. When in a domestic state, they remove not to any great distance, and always return to the house spontaneously. But they constantly retain a little of their savage disposition. In general, they remain in their holes during the night, unless the moon shines bright; but they run about during most of the day. There are some countries, as about the mouth of the river of the Amazones, where these animals are so numerous, that they are often met with in scores.

The agouti appears to be an animal peculiar to the southern parts of America, as none of them are ever found in the Old World. They are common in Brasil, in Guiana, in St. Domingo, and in all the islands. They seem to require a warm climate, in order to subsist and to multiply. They can live, however, in France, if kept in a dry place, and sheltered from the winter frosts. Even in America, they appear not in the temperate or cold regions. In the islands, there is only the species of agouti which we have described. But at Cayenne, and in Guiana and Brasil, a second species is mentioned, called *agouchi*, which is said to be uniformly smaller than the first. But we are assured, by the evidence of persons who have lived long at Cayenne, and who know both the agouti and agouchi, the latter of which we have never been able to procure,

that the animal we have described is the true agouti. We had it alive: it was as large as a rabbit; its hair was rude, and of a brown colour, a little mixed with red. Its upper lip was divided, like that of the hare: its tail was still shorter than the tail of the rabbit: the ears were short and broad; the upper jaw advanced beyond the under; the muzzle resembled that of the dormouse, and the teeth those of the marmot; the neck was long, and the legs slender: it had four toes on the fore, and three on the hind-feet. Marcgrave, and most naturalists after him, have asserted, that the agouti had six toes on the hind-feet. M. Brisson is the only writer who has not copied this error of Marcgrave: having described the animal from nature, he found, as we did, only three toes on the hind-feet.



A Bell Sculp.t

Acouchi.

THE AKOUCHI, OR OLIVE CAVY *.

THE akouchi is pretty common in Guiana, and other parts of South America. It differs from the agouti by having a tail, which is wanting in the agouti. The akouchi is generally smaller than the agouti, and its hair is not red, but of an olive colour †.

The akouchi differs from the agouti still more in magnitude, being no larger than a young rabbit of six months old. The akouchi is found only in extensive woods. He feeds on the same fruits, and has nearly the same manners with the

* CHARACTER SPECIFICUS.

CAVIA ACUSCHY. — C. caudata, corpore olivaceo. — *Linn. Syst. Nat. Gmel.* i. p. 121. — *Erxleb. Mamm.* p. 354. — *Shereb.* iv. p. 612, pl. 171. B.

L'AKOUCHI. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 164, pl. 5, fig. 3.

OLIVE CAVY. — *Penn. Hist. Quadr.* ii. p. 95.

ACOUCHY. — *Shaw's Gen. Zool.* ii. p. 27, pl. 126.

HABITAT

vulgaris in Guiania reliquaque America australi.

W.

† Cuniculus minor, caudatus, olivaceus. — *Akouchi, Barrère, Hist. Nat. de la Fr. Equin.* p. 153.

agouti. In the islands of Saint Lucia and Grenada, he is called *agouti*. His flesh is white, and has the flavour of a young rabbit; and he is ranked amongst the finest game in South America. When the akouchis are pursued by dogs, rather than take the water, they allow themselves to be seized. M. de la Borde informs us, though I doubt the fact, that the females produce only one, or at most two young at a litter. They are easily tamed, and have a small cry like that of the Guinea-pig; but it is seldom heard.

These are the only differences we know between the akouchi and agouti, which, however, seem to be sufficient to constitute two distinct species.

We have given a figure of this animal, drawn from a well preserved skin. Messrs. Aublet and Olivier assure me, that, in Cayenne, the hare is called *agouti*, and the rabbit *akouchi*; but that the agouti is the best food; and, speaking of the game of this country, they inform me, that the armadillos are still better food, except the nine-banded armadillo, which has a strong smell of musk; that, after the armadillos, the paca is the best game, because its flesh is wholesome and fat: the next in order are the agouti and akouchi. They likewise maintain, that the red couguar is used as food, and that its flesh has the taste of veal.

THE ROCK CAVY*.

THIS animal, which is a native of Brasil, is neither a rabbit nor a rat, but seems to partake of both. It is about a foot long, by seven inches in circumference. Its general colour is the same with that of our hares; and its belly is white: its upper lip is divided in the same manner, and

* CHARACTER SPECIFICUS.

Cavia Aperea. C. ecaudata, corpore ex cinereo rufo. — *Linn. Syst. Nat. Gmel.* i. p. 122. — *Erxleb. Mamm.* p. 348.

Cuniculus (Brasiliensis) ecaudatus auritus ex cinereo rufus. — *Briss. Quadr.* p. 149.

Cuniculus Brasiliensis, Aperea dictus. — *Marcgr.* — *Ray's Quadr.* p. 206.

Cuniculus indicus femina. — *Aldrov. Dig.* p. 393.

Aperea Brasiliensibus. — *Marcgr. Bras.* p. 223. — *Jonst. Quadr.* pl. 63.

L'Aperea. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 165.

Rock Cavy. — *Penn. Hist. Quadr.* ii. p. 90. — *Shaw's Gen. Zool.* ii. p. 28.

HABITAT

in Brasiliæ speluncis fissurisque rupium.

W.

Rock cavy, with divided upper lip; short ears; four toes on the fore-feet, and three on the hind: colour of the upper part of the body like that of the common hare; belly white: the length one foot. — *Penn. Synops. Quadr.* p. 244.

it has the same large cutting teeth; and whiskers round the mouth and on the sides of the eyes. But its ears are rounded like those of the rat, and so short that they exceed not the height of a finger's breadth. The fore-legs are not above three inches in length, and those behind are a little longer. The fore-feet have four toes covered with a black skin, and armed with small short claws. The hind-feet have only three toes, and the middle one is the longest. It has no tail. Its head is somewhat longer than that of the hare, and its flesh is like that of the rabbit, which it resembles in its manner of living *. It likewise retires into holes: it does not, however, dig the earth, like the rabbit, but conceals itself in the clefts of rocks. Hence it is easily seized in its retreat. It is hunted as game, and its flesh is preferable to that of our best rabbits †. The animal mentioned by Oviedo, and afterwards by Charlevoix ‡ and du Perrier de Montfraizier, under the denomination of *cori*, appears to be the same with the *aperea*, or rock cavy §. In some parts of the West In-

* Marcgr. Hist. Nat. Brasil, p. 223.

† Piso, Hist. Brasil, p. 103.

‡ Oviedo remarks, that the *cori* resembles a small rabbit; and that some of them are totally white, and others a mixture of different colours. — *Hist. de St. Dominique, par le P. Charlevoix*, tom. i. p. 35.

§ The *cori* is a small quadruped, somewhat resembling our rabbits and moles. It has small ears, which it carries so flatly reclined backward, that it is difficult to perceive them. It has no tail. Some of them are white, others black, and others spotted with black and white. Some of them are totally red,

dies, these animals may, perhaps, be reared in warrens, or in houses, like our rabbits; and this may be the reason why some of them are red, white, black, and variegated. This conjecture is not without foundation; for Garcilasso informs us, that, in Peru, there are wild and domestic rabbits which have no resemblance to those of Spain *.

and others spotted with red and white. They are tamed, and never defile the houses. They eat herbage, and are easily maintained. Their flesh has the taste and flavour of the best rabbits. — *Hist. des Voyages, par du Perrier de Montfraizier,* p. 343.

* Hist. des Incas, tom. ii. p. 207.

THE LION*.

THE influence of climate, in the human species, is marked only by slight varieties; because this species is single, and extremely distinct

*CHARACTER SPECIFICUS†.

FELIS LEO. F. cauda elongata, corpore helvolo. — *Linn. Syst. Nat. Gmel.* i. p. 75. — *Schreb.* iii. p. 376, pl. 97. A. B.

Felis cauda elongata floccosa, throrace jubato. — *Syst. Nat.* vi. p. 4, No. 1.

Felis cauda in floccum desinente. — *Briss. Quadr.* p. 194.

LEO. — *Gesn. Quadr.* p. 572. — *Aldrov. Dig.* p. 2. — *Jonst. Quadr.* p. 72, pl. 68. — *Ray's Quadr.* p. 162.

LE LION. — *Buff. Hist. Nat. par Sonn.* xxvi. p. 170, pl. 7.

LION. — *Penn. Hist. Quadr.* i. p. 274. — *Shaw's Gen. Zool.* i. p. 337, pl. 81. — *Wood's Zoography.* i. p. 210, pl. 9.

HABITAT

in Africa, rarior in calidioribus Asiæ; Americæ plane exul.

W.

In Greek, *Λεων*; in Latin, *Leo*; in Italian, *Leone*; in Spanish, *Leon*; in German, *Lew*; in Swedish, *Leyon*; in French, *Le Lion*.

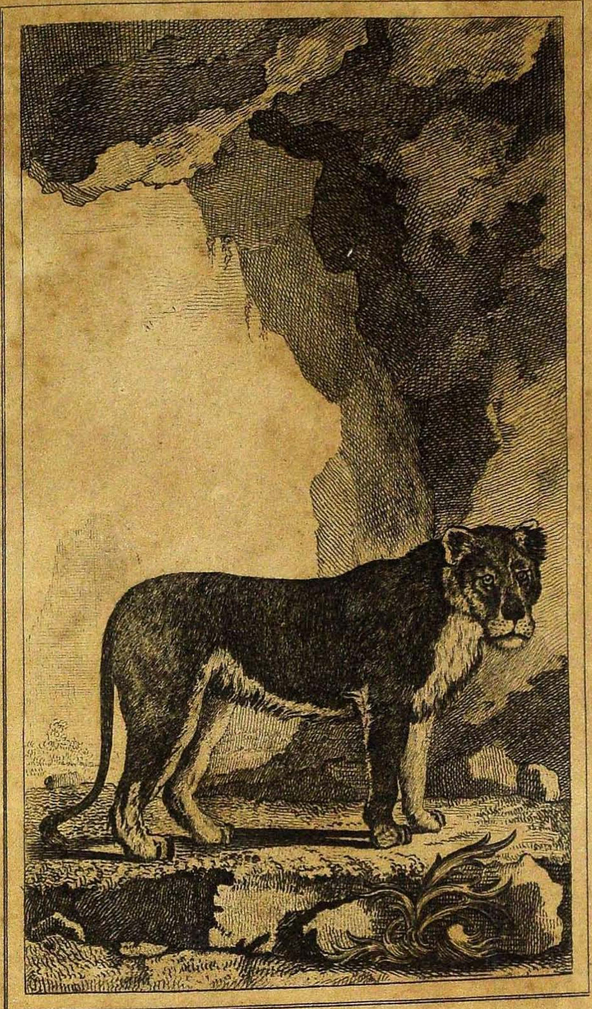
Cat with a large head; short rounded ears; face covered with short hairs; upper part of the head, chin, whole neck and shoulders, with long shaggy hairs, like a mane; hair on

† For the generic character, see Cat.

182

LION.

Plate 164



LIONESS.

from every other. Man, white in Europe, black in Africa, yellow in Asia, and red in America, is the same animal, tinctured with the colour peculiar to the climate. As he is formed to exercise dominion over the earth, and as he has the whole globe for his habitation, his nature seems to be accommodated to every situation. Under the fervours of the south, or the frozen regions of the north, he lives, multiplies, and is so universally and so anciently diffused over every country, that he appears to have no peculiar climate. Among the other animals, on the contrary, the influence of climate is stronger, and marked by sensible characters; because they differ in species, and their nature is perfect, and less diffused than that of man. The varieties of each species are not only more numerous, and more strongly marked, but even the differences of species themselves seem to depend upon the differences of climate. Some are unable to propagate but in warm, and others cannot subsist but in cold countries. The lion never inhabited the northern regions, the rein-deer was never found in the south; and perhaps no other species but that of man is generally diffused over the whole surface of the globe. Each has its peculiar country, to which it is confined by a physical neces-

the body and limbs short and smooth; along the bottom of the belly long; limbs of vast strength; tail long, with a tuft of long hairs at the end; colour tawny, but on the belly inclines to white; length of the largest lion, from nose to tail, above eight feet; the tail four feet: the lioness or female is less, and wants the mane. — *Penn. Synops. Quadr.* p. 164.

sity; each is a genuine son of the country it inhabits; and it is in this sense alone, that particular animals ought to be called natives of a particular climate.

In warm countries, the land animals are larger and stronger than in the frozen or temperate regions. They are likewise more hardy and ferocious. All their natural qualities seem to originate from the ardour of the climate. Lions, born under the scorching heats of Africa or the Indies, are the strongest, the fiercest, and the most formidable. Our wolves, and other carnivorous animals, would hardly have the merit of being his providers *. The lions of America, if they deserve that name, are, like the climate, infinitely more mild than those of Africa; and, what proves that the excess of their ferocity originates from the excess of heat is, that, in the same country, those who inhabit the high mountains, where the air is temperate, differ in disposition from those who live in the plains, where the heat is extreme. The lions of Mount Atlas, the summit of which is sometimes covered with snow, have neither the courage, the strength, nor the ferocity of the lions of Biledulgerid or of Zaara, whose plains are covered with burning sands. It is chiefly in these fervid deserts that we meet with those terrible lions, who are the dread of travellers, and the scourge of the neighbouring provinces. Happily the species is not numerous: it even appears to diminish daily; for, from the tes-

* There is a species of Lynx called *the Lion's Provider.*

timony of those who have traversed this part of Africa, the number of lions is not nearly so great as formerly. The Romans, says Mr. Shaw*, drew from Lybia, for their public spectacles, fifty times more lions than could now be found in that country. It has likewise been remarked, that, in Turkey, Persia, and India, lions are much less frequent than they were in ancient times: and, as this bold and powerful creature preys on every other animal, and is himself a prey to none, the diminution of the species can only be attributed to the increase of the numbers of mankind; for, it must be allowed, that the strength of the king of animals is not match against the address of a Hottentot or a Negro, who often attack him, face to face, with very light weapons. The lion, having no enemy but man, and his species being reduced to a fiftieth, or, if you will, to a tenth part of its former standard, it follows, that the human species, instead of having suffered any considerable diminution since the time of the Romans (as has been often alleged), is, on the contrary, increased, even in such countries as Lybia, where the power of man appeared to have been greater during the æra of Carthage, than it is now under that of Tunis and Algiers.

Man's industry augments in proportion to his numbers; but that of the other animals remains always the same. All the destructive species, as

* Shaw's Travels.

that of the lion, seem to be banished to distant regions, or reduced to a small number, not only because mankind have increased, but because they have also become more powerful, and have invented formidable arms which nothing can resist. Would to God man had never combined the operations of steel and fire for other purposes than those of destroying lions and tigers!

This superiority of man in numbers, and in industry, which has impaired the force of the lion, has likewise enervated his courage. Among animals this latter quality, though natural, rises or falls according as the exertions of their strength are successful or abortive. In the vast deserts of Zaara, in those which seem to separate two very different races of men, the Negroes and the Moors, in the unpeopled regions that lie about the territories of the Hottentots, and, in general, in all those southern parts of Africa and Asia, which man has disdained to inhabit, the lions are still very numerous, and continue in their natural state *. Accustomed to measure

* Barrow, in his Travels in Southern Africa, speaks of the lion as a common animal in that country, and gives an account of his taste for Hottentots' flesh, that deserves to be noticed: "A Hottentot," says Barrow, "belonging to one of the farmers, had endeavoured for some time, in vain, to drive his master's cattle into a pool of water, enclosed between two ridges of rock; when at length he espied a huge lion crouching in the midst of the pool; terrified at the unexpected sight of such a beast, that seemed to have its eyes fixed upon him, he instantly took to his heels, leaving the cattle to shift

their strength with that of every animal they meet, the habit of conquering renders them ter-

for themselves. In doing this he had presence of mind enough to run through the herd, concluding, that, if the lion should pursue, he might take up with the first beast that should present itself. In this, however, he was mistaken: the lion broke through the herd, making directly after the Hottentot; who, on turning round, and perceiving that the monster had singled him out for a meal, breathless and half dead with terror, scrambled up one of the tree aloes, in the trunk of which had luckily been cut out a few steps, the more easy to come at some birds' nests that the branches contained. At the same moment the lion made a spring at him, but, missing his aim, fell upon the ground. In surly silence he walked round the tree, casting every now and then a dreadful look towards the poor Hottentot, who had crept behind some finches' nests that happened to have been built in the tree. It was on one of these edifices that the Hottentot screened himself from the sight of the lion. Having remained silent and motionless for a length of time, he ventured to peep over the side of the nest, hoping that the lion had taken his departure; when, to his great terror and astonishment, his eyes met those of the animal, to use his own expression, 'flashing fire at him.' In short, the lion laid himself down at the foot of the tree, and stirred not from the place for four and twenty hours. He then returned to the spring to quench his thirst; and, in the mean time, the Hottentot descended from the tree, and scampered to his home, which was not more than a mile distant, as fast as his feet could carry him. The perseverance of the lion was such, that it appeared afterwards he had returned to the tree, and from thence had hunted the Hottentot, by the scent, within three hundred paces of the house."

The reader of this note will perhaps be inclined to discredit the account from the circumstance of the Hottentot hiding himself behind a bird's nest; but this apparent exaggeration will vanish when he is told, that, in Africa, a species of loxia (the *loxia socia* of Latham, Suppl. 2) collect together, and

rible and intrepid. Being ignorant of the power of man, they are not afraid to encounter him. Having never experienced the force of his arms, they hold them in defiance. Wounds enrage, without terrifying them. They are not disconcerted even by the appearance of numbers. A single lion of the desert often attacks a whole caravan; and if, after a violent and obstinate engagement, he finds himself fatigued, instead of flying, he retreats fighting, always opposing himself to the enemy. Those lions, on the other hand, who dwell in the neighbourhood of the towns or villages of India or Barbary *, being acquainted with man, and the power of his arms, have lost their native fortitude to such a degree, that they fly from the threatening of his voice, and dare not attack him. They content themselves with seizing small cattle, and even fly before the women and children †, who make them indignantly quit their prey, by striking them with clubs.

This change, this softening in the temper of the lion, indicates that he is susceptible of the

form a clump of nests, which sometimes extends a space of ten feet in diameter, and contains a population of several hundred individuals. Each bird has its own separate nest, though the whole are united under one common covering. This curious structure is accurately represented in *Wood's Zoography*, i. pl. 15. *W.*

* L'Afrique de Marmol, tom. ii. p. 213, et la Relation du Voyage de Thevenot, tom. ii. p. 112.

† L'Afrique de Marmol, tom. i. p. 54.

impressions he receives, and that he must possess a docility sufficient to render him tameable to a certain degree, and to admit of a species of education *: and history informs us that lions

* We have a striking example of this in the history of a lion which Toscan, librarian to the Museum d'Historie Naturelle at Paris, has given in the *Decade, phil. et litter.* No. 19 et 38, ann. 1798. He was taken in the forests of Senegal when only four months old. Pelletan, then director of the African Company (1787), had the care of him: the mildness of his countenance pleaded his cause so effectually, that he was permitted to remain without being chained, and, sensible of the good treatment he received from the inhabitants of the house, he became so caressing, that he might almost be considered a dog in the form of a lion. Whenever his name (*woira*) was pronounced, if within hearing, he obeyed the signal, and came without the slightest appearance of ill humour. He was so fond of society, that he always sought the most frequented places. When driven from the parlour he directly went to the kitchen. But the most singular trait in his character was the perfect harmony which reigned between him and the other domestic animals. Sheep, dogs, cats, monkeys, geese, ducks, &c., all slept quietly in the same place.

When the lion was eight months old, a circumstance occurred that deserves attention. A bitch dropped two puppies near the place where the lion slept: this new family excited his interest, he became, as it were, a parent to them, and seemed anxious to share the trouble of the mother. One of the puppies died, and this increased his affection for the other: he gained his confidence, and became his friend. The disproportion of their physical strength was no obstacle to their union, for when with his canine family the king of beasts forgot his power; and it is said that the mother of the young dog, when tired of her company, would drive them from her without even offending the lion. Thus, says Latrielle, was formed the bond of union described with so much interest by Toscan, and to which Paris has been witness.

In 1788, when fourteen months old, he was embarked for

have been yoked in triumphal cars, and conducted to the battle or the chase; and that, faithful to their masters, they never exerted their strength or their courage but in opposition to the common enemy. This much is certain, that the lion, when taken young, and brought up among domestic animals, is easily accustomed to live, and even to sport innocently with them; that he is gentle and caressing to his master; and that, if he sometimes resumes his natural ferocity, he seldom turns his rage against his benefactors. As his movements are impetuous, and his appetites vehement, we ought not to presume that they can always be balanced by the impressions of education. It is dangerous, therefore, to allow him to want food too long, or to irritate him unnecessarily. Bad treatment not only enrages him, but he remembers it, and seems to meditate revenge in the same manner as he remembers and requites benefits received. Here I might quote a great number of

France with his friend. A chain was prepared to confine him with, in case this alteration should influence his manners and render him savage, but he was always the same, and continued to deserve his liberty. He was landed at Havre, and from thence conducted to Versailles, followed by his faithful dog, and simply confined by a cord attached to his collar. After his companion died, another dog was put into the lodge, towards which he was unjustly accused of cruelty. Terrified to find himself in company with a lion, the poor animal hid himself in the den, and made such a noise to get out of his confinement, that the lion, willing to correct his ill behaviour, gave him a blow with his paw that occasioned his death. A third dog was introduced in the room of the others, which he quietly suffered to live with him. *W.*

particular facts, some of which appear to be exaggerated; but the whole, when combined, are sufficient to prove, that the anger of the lion is noble, his courage magnanimous, and his temper susceptible of impressions. He has often been known to disdain the insults, and to pardon the offensive liberties, of weak enemies. When led into captivity, he discovers symptoms of uneasiness, without anger or peevishness; on the contrary, he assumes habits of gentleness, obeys his master, caresses the hand that feeds him, and sometimes pardons the animals which are thrown to him for prey. By this act of generosity, he seems to consider himself as for ever bound to protect them; he lives peaceably with them, allows them a part, and sometimes the whole of his food, and will rather submit to the gnawings of hunger than destroy the fruit of his own beneficence.

The lion cannot justly be branded with cruelty, since he acts from necessity, and kills no more than he consumes; while the tiger, the wolf, the hyæna, and many other inferior species, such as the fox, the martin, the polecat, the ferret, &c., delight in slaughter, and seem rather to gratify their rage than their hunger.

The external appearance of the lion detracts not from the noble and generous qualities of his mind. His figure is respectable, his looks firm and determined, his gait stately, and his voice tremendous. His bulk is not excessive, like that of the elephant or rhinoceros. He is not gross and unwieldy, like the hippopotamus or the ox, nor too contracted, like the hyæna or the bear,

nor lengthened to deformity, like the camel. The body of the lion, on the contrary, is so well poised and proportioned, that it may be regarded as a perfect model of strength combined with agility: equally solid and springy, neither surcharged with fat nor with flesh, and containing nothing superfluous, he seems to be constituted entirely of nerves and of muscles. This great muscular force is manifested by the prodigious leaps and bounds which he performs with ease; by the brisk movements of his tail, a single sweep of which is sufficient to throw a man to the ground; by the facility with which he moves the skin of his face, and especially that of his front, which heightens greatly the expression of fury; and, lastly, by the power of moving the hair of his mane, which he not only erects, but agitates on all sides, when he is enraged.

To all these splendid individual qualities of the lion, we may add the nobleness of his species. By noble species in Nature, I mean those which are constant, invariable, and liable to no suspicion of degradation. These species are commonly singular, and of themselves constitute a genus. They are distinguished by characters so deeply marked, that they can be neither mistaken, nor confounded with any other. To begin with man, who is the noblest being of the creation, his species is single, since men of all races, of all climates, and of all colours, can mix and propagate together; and, at the same time, no animal can be said to make any approaches to the human species by natural relation. In the horse, the species is not so noble as the indi-

vidual; because he is so nearly approached by the ass, that a junction of the two produces individuals, whom Nature treats as bastards, unworthy of the genuine race, and renders incapable of perpetuating either species of which they are the issue; but, as proceeding from a mixture of the two, they fail not to demonstrate the great affinity between them. In the dog, the species is, perhaps, still less noble, because it seems to be allied to that of the wolf, the fox, and jackall, who may all be regarded as degenerated branches of the same family. In descending gradually to the inferior species, as those of the rabbit, weesel, rat, &c., we shall find that each particular species has a number of collateral branches of which we are unable to discover the genuine root. Lastly, in the insects, which ought to be regarded as the lowest species in Nature, each kind is accompanied with so many neighbouring species, that we are obliged to denominate them by genera only. This is the chief use of methodical distributions, which ought not to be employed, except in difficult enumerations of the smallest objects in Nature, but which become totally useless, and even ridiculous, in treating of the particular tribes. To class man with the monkey, or to say, that the lion is *a cat with a long mane and tail*, is to degrade and disfigure, instead of describing or denominating the objects of Nature.

The species of the lion, therefore, is one of the most noble, because it is single, and cannot be confounded with that of the tiger, leopard,

ounce, &c. These species, which seem to be the least removed from the lion, are so little distinguished from each other, that they have often been confounded by travellers and methodists *.

The largest lions are about eight or nine feet long, by four or five feet high, and the tail is about four feet long †. The small sized lions are about five and a half feet long, by three and a half feet high, and the tail is about three and a half feet in length. The lioness, in all dimensions, is about one fourth part less than the lion.

Aristotle ‡ distinguishes lions into the greater and the smaller; the latter, he remarks, are proportionally shorter in the body, have their hair more crisped, and are less courageous than the former. He adds, that, in general, all lions are of a yellow colour. The first of these facts seems to be doubtful; for no traveller mentions lions with crisped hair: some authors, who, in other respects, appear not to merit entire confidence, talk of a tiger with crisped hair, which is found at the Cape of Good Hope §. But almost all authors agree as to the colour of the lion, which is yellow on the back, and whitish on the sides and belly. Ælian and Opian, however,

* See the article Tiger, where we have mentioned some animals to which this name has been improperly applied.

† A very young lion dissected by the gentlemen of the Academy was seven and a half feet long, from the extremity of the muzzle to the origin of the tail, and four and a half feet high.

‡ Hist. Anim. cap. 44.

§ Les Mem. de Kolbe, in which he calls this animal the *Wolf-Tiger*.

affirm, that the Ethiopian lions are as black as the men; that, in India, there are lions entirely white, and others spotted with different colours, as red, black, and blue. But this seems not to be supported by any authentic evidence; for Marc-Paul, the Venetian, speaks not of these spotted lions as if he had seen them; and Gesner * properly remarks, that he only followed Ælian. It appears, on the contrary, that there are little or no varieties in this species; that the lions of Africa and of Asia are perfectly similar; and that the lions of the mountains differ from those of the plains in stature only, and not in colour.

The lion has a mane, or rather long hair, which covers almost all the anterior parts of his body †, and grows always longer as he advances in age. But the lioness, however old, has no mane. The American animal, called *a lion* by the Europeans, and *puma* by the natives of Peru, has no mane, and is also smaller, weaker, and less courageous than the true lion. It is not impossible, that the mildness of this region of South America should have had such influence on the nature of the lion, as to deprive him of his mane, and diminish both his courage and his stature. But it seems to be an absolute impossibility, that this animal, who inhabits the countries within the Tropics only, and against whom Nature appears to have shut up every avenue to the north, should have passed from the southern regions of

* Gesner, Hist. Anim. Quad. p. 574.

† This mane consists of hair equally soft and smooth as that of the rest of the body.

Asia or Africa into America, these continents being divided from each other, towards the south, by immense oceans. Hence we are led to conclude, that the puma is not a lion sprung from those of the Old World, and degenerated by the influence of the climate of America, but that he is an animal peculiar to America, like most animals of the New Continent. When the Europeans first discovered America, they found the quadrupeds, birds, fishes, insects, plants, and almost every thing, perfectly different from those of Europe. It was, therefore, necessary to denominate the principal objects of this New World. The names given them by the natives were mostly barbarous, and very difficult to pronounce or to remember. The names of objects were, of course, borrowed from those of the European languages, and especially from the Spanish and Portuguese. In this penury of denomination, the smallest analogy in external figure or in stature, is sufficient to make us attribute to unknown objects the names of those with which we are acquainted. This gives rise to endless uncertainties and confusion, which are still farther augmented, not only by giving to the productions of the New World the denominations of those of the Old, but by the continual transportation of European plants and animals into America. To obviate these difficulties, we ought carefully to distinguish what belongs to the one continent from what belongs to the other, and to avoid the deceptions originating from improper denominations. We shall perceive the necessity of this

discrimination in the subsequent article, where an enumeration of the animals peculiar to both continents shall be given.

M. de la Condamine, whose evidence merits the highest credit, says expressly, that he knows not whether the American animal called *a lion* by the Spaniards, and *puma* by the natives of Quito, deserves the name of a lion: he adds, that it is much smaller than the African lion, and that the male has no mane *. Fresier likewise informs us, that the animals called *lions* in Peru, are very different from those of Africa; that they fly upon the approach of man; and that they are dreadful to the flocks only: he farther remarks, that their head somewhat resembles both the head of the wolf and of the tiger; and that their tail is less than the tail of either of these animals †. We learn, from more ancient relations ‡, that the American lions have no resemblance to those of Africa; that they have neither the stature nor the boldness of the true lion; that they are neither red nor yellow, but of a gray colour; that they have no manes, and are accustomed to climb trees. Hence these animals differ from the lion in stature, in colour, in the form of the head, in the length of the tail, in the want of manes, and in their manners and dispositions. Characters so numerous and so essential ought for ever to prevent us from confounding the puma of America with the genuine lion of Africa or Asia.

* Voyage de l'Amerique Meridionale, p. 24.

† Le Voyage de Fresier à la Mer du Sud, p. 132.

‡ Joseph Acosta, Nat. Hist. of the Indies.

Though this noble animal inhabits the warmest climates only, he can subsist for a great length of time in temperate countries, and, perhaps, with some attention, might even be enabled to propagate. Gesner relates that lions were brought forth in the menagerie of Florence; and Willoughby tells us, that, in Naples, a lioness that had been impregnated by a lion in the same den, brought forth five whelps at one litter. These examples are rare; but, if true, they prove that lions are not absolute strangers to a temperate climate. None of them, however, exist in the southern parts of Europe: in the age of Homer, there were no lions in the Peloponnesus, although they were then, and even in the days of Aristotle, in Thrace, in Macedonia, and in Thessaly. It is apparent, therefore, that, in all ages, they preferred the hot climates; that they seldom lived in temperate countries; and that they never inhabited the more northern regions. The naturalists above quoted, who speak of lions brought forth at Florence and Naples, are silent as to the time of the female's gestation, the size of the new-born whelps, and the quickness or slownesss of their growth. Ælian * limits the time of gestation to two months; but Philostratus and Edward Wotten † extend it to six. I am inclined to be of the latter opinion; for the lion is an animal of great magnitude; and we know, that, in general, among large animals, the

* Gesner, Hist. Quad. p. 575.

† Lib. de Differ. Anim. cap. 80.

time of gestation is longer than among the smaller species. The same thing takes place with regard to the growth of the body. Both ancients and moderns agree, that new born lions are very small, being about the size of a weesel *, that is, six or seven inches in length. They must, therefore, require several years before they can grow eight or nine feet long. The young lions are likewise said to be two months old before they can walk. Without giving implicit faith to these facts, we may, with probability, presume, that the lion, from the largeness of his body, must require three or four years in acquiring his full growth, and that he ought to live about seven times three or four years, or nearly to the age of twenty-five. The Sieur de St. Martin, master of the bull-fights at Paris, assures me, that he has kept lions sixteen or seventeen years; and he imagines that they live not above the age of twenty or twenty-two. He has kept others twelve or fifteen years; and it is well known that their lives must be abridged, and their constitution weakened, by the want of exercise, confinement, and chagrin †.

* Lib. de Differ. Anim. cap. 80.

† The lion produces but once a year. With respect to the time of gestation, naturalists have been divided; some asserting that the lioness goes with young six months, and others but two. The time also of their growth, and their age, has till lately been left in obscurity; some maintaining that in three years they arrive at their full size, while others give them a longer period to acquire their growth. Buffon, as we have seen above, allows them to live but twenty or twenty-two years at most: others make their lives even of shorter duration.

Aristotle affirms, in two different parts of his works *, that the lioness produced five or six whelps at the first litter, four or five at the second, three or four at the third, and two or three at the fourth; and that, after this last litter, which is always the least numerous, she becomes barren. This assertion merits no credit; for, in all animals, the first and last litters are less numerous than the intermediate ones. This philosopher erred, as well as all the naturalists who came after him, when he maintained that the lioness had two paps only; for it is now certain that she has four. He likewise affirms †, that the lion, the bear, and the fox, are brought forth in an un-

All these doubts, however, are now reduced to certainty, since several of these animals have been bred in the Tower; and consequently the time of their gestation, the number they bring forth, and the time they take to come to perfection, are all well ascertained. The lioness, according to the account of her keeper, does not go more than five months with young, the young ones, which never exceed two in number, are, when brought forth, about the size of a large pug dog, harmless, pretty, and playful: they continue at the teat for twelve months, and the animal is more than five years in coming to perfection. Imprisoned within the space of a few square feet, and deprived of his natural climate, food, exercise, and every thing that can render life desirable, his existence is probably very much shortened, and no certainty whatever respecting the length of his life in a state of freedom, can be derived from the captive animal. The great lion called Pompey, who died in the year 1760, was known to have been in the Tower above seventy years; and one which was brought from the river Gambia has since died there aged sixty-three. *W.*

* Arist. de Generatione, lib. iii. cap. 2 et 10.

† Ibid. lib. iv. cap. 6.

formed state: but it is now past a doubt, that these creatures are as well formed at birth as any other animals, and that all the members are distinctly unfolded. Lastly, he affirms, that the lions copulate in a reversed manner *; but, from a bare inspection of the parts of the male, it is evident, that the lion must copulate in the ordinary way of other quadrupeds. I have mentioned these slight errors of Aristotle, because the authority of this great man has deceived all the writers on natural history since his time. What he remarks of the lion's neck being composed of one rigid and inflexible bone, has also been contradicted by experience; for, in every quadruped, without exception, and even in man, the neck consists precisely of seven vertebræ. It is another general fact, that the necks of carnivorous animals are shorter than those of the frugivorous, and particularly of the ruminating species. But this difference in the length of the neck depends on the largeness of each vertebra, and not on their number, which is always the same, from the elephant to the mole. With regard to the solidity of the lion's bones, which Aristotle affirms to have neither marrow nor cavity; to their hardness, which he compares to that of flint; and to their property of striking fire with steel; these blunders ought not to have been repeated by Kolbe †; nor should they have come

* Hist. Anim. lib. v. cap. 2. Linn. Syst. p. 60. Leo retro mingit et coit.

† Mem. de Kolbe, tom. iii. p. 4.

down to our time; since, even in the days of Aristotle, they were ridiculed by Epicurus.

The lions are exceedingly ardent in their amours. When the female is in season, she is sometimes followed by eight or ten males *, who incessantly roar around her, and engage in the most furious combats, till one of them conquers all the rest, and retires in peaceable possession of his mate. The lioness brings forth in the spring †, and produces but once in the year; which shows that she is occupied for some months in suckling and taking care of her young; and, consequently, that the time of their growing, when they need the assistance of the mother, is at least several months.

In these animals, all the passions, even those of the softest kind, are excessive. The maternal affection of the lioness is extreme. Though naturally weaker, and less courageous than the lion, whenever she has young, she becomes dreadfully ferocious. She then exposes herself with more boldness than the lion; she knows no danger; she attacks, indiscriminately, men and every other animal; and, after slaying them, carries them home to her whelps, whom she soon accustoms to suck the blood, and tear the flesh. She commonly brings forth in places the most sequestered and inaccessible; and, when afraid of being discovered, she conceals the

* Gesner, Hist. Quad. p. 575.

† Id. ibid.

tracks of her feet, by returning several times on her steps, or effaces them with her tail. When her anxiety is great, she sometimes transports her young to a different place; and, if the hunters attempt to force them from her, she becomes perfectly furious, and defends them to the last extremity.

The lion, it is alleged, has neither the senses of smelling nor of seeing so acute as most animals of prey. The light of the sun seems to incommode him; he seldom goes abroad in the middle of the day, but makes all his excursions during the night: when he sees the fires burning around the flocks, he never approaches them. It has also been remarked, that he perceives not the odour of other animals at a distance; that he hunts by the eye only, and not by the scent, like the dog and the wolf, whose sense of smelling is finer. Even the name of *guide,'* or *lion's provider*, has been given to a species of lynx, which is supposed to have a piercing eye and exquisite scent; and, it is said, that this lynx always follows or precedes the lion, to point out his prey. We are acquainted with this animal, which, like the lion, inhabits Arabia, Lybia, &c., and which sometimes follows the lion with a view to pick up what he leaves; for, being smaller, and much weaker, he should rather fly from the lion than serve him.

The lion, when pressed with hunger, boldly attacks every animal that comes in his way. But, as he is extremely formidable, and is anxiously avoided by every beast of the forest, he

is often obliged to lie concealed in the paths where animals commonly pass. He lies squat on his belly among brushwood, from which he darts with such force, that he often seizes his prey at the first bound. In the deserts and forests, antelopes and monkeys are his common food, though he takes the latter when upon the ground only; for he climbs not trees like the tiger or the puma *. He devours as much at a time as will serve him two or three days. His teeth are so strong, that he breaks bones with ease, and swallows them along with the flesh. He is said to support hunger very long. As his temperament is exceedingly hot, he is impatient of thirst, and drinks as often as he finds water, which he laps like a dog. The tongue of the dog, when lapping, is bended upwards; but that of the lion is bended downward, which occasions him to drink long, and to lose much water. He requires about fifteen pounds of raw flesh every day. He prefers the flesh of living animals, especially of those whom he slays himself. He does not willingly eat putrid carcasses, and chooses rather to hunt for a fresh prey than to use the remains of a former. Though he commonly feeds upon fresh meat, his breath is very rank, and the odour of his urine is insupportable.

The roaring of the lion is so loud, that, when uttered during the night in the deserts, it resembles, by the repetition of echoes, the noise of

* Klein de Quad. p. 82.

thunder * †. This roaring is the ordinary voice of the lion; for, when enraged, he utters a short, and suddenly repeated cry. But the roaring is a prolonged cry, a kind of a deep-toned grumbling, mixed with a sharp vibrating noise. He roars five or six times in the day, and oftener before rain ‡. When enraged, his cry is still more terrible than his roaring. He then beats his sides and the earth with his tail, agitates his mane, moves the skin of his face, and his large

* Voyages de la Boulaye-le-Gouz, p. 320.

† This awful noise serves as a signal for the lesser animals to save themselves by flight; but, as the lion, according to report, always puts his mouth to the ground when he roars, the sound is equally diffused in all directions, so that it is impossible to ascertain from what quarter it proceeds; and the affrighted animals, flying about in every direction, frequently run to the very spot they ought to shun, and become the easy prey of the animal they are so anxious to avoid. The slow and prolonged note, together with the nocturnal darkness, and the terrible idea one is ready to form of this tremendous animal, never fails to make the most alarming impression on the hearer; and, such is the power of instinct, that dogs and cattle are said to betray a consciousness of the vicinity of a lion, whether he roars or not. Dr. Sparman, upon whose authority this assertion must rest, assures us, that, in this situation, his hounds did not venture to bark, but kept close to the Hottentots; his oxen and horses sighed deeply, lay down on the ground, and stood up alternately, as if they did not know what to do with themselves; frequently hanging back, and pulling slowly, with all their might, at the strong straps with which they were tied up to the waggon: and this, as he observes, from pure instinct, having never seen a lion in their lives. *W.*

‡ These facts I learned from the Sieur Saint-Martin, master of the bull-fights, who has kept several lions.

eyebrows, shows his dreadful tusks, and thrusts out his tongue, which is armed with prickles so hard, that it alone is sufficient to tear the skin and the flesh, without the assistance of either teeth or claws. His strength lies more in the head, jaws, and fore-legs, than in the posterior parts of his body. He sees in the night like the cats. His sleep is short, and he is easily awaked. But it is a mistaken notion, that he sleeps with his eyes open.

The ordinary pace of the lion is bold, grave, and slow, though always oblique. His course consists not of equal movements, but is performed by leaps and bounds; and his motions are so brisk, that he cannot instantly stop, but generally surpasses his aim. When he leaps on his prey, he makes a spring of twelve or fifteen feet, falls above the victim, seizes it with his fore-feet, tears it in pieces with his claws, and then devours it with his teeth. While young and nimble, he lives by hunting, and seldom quits the deserts or the forests, where he finds plenty of wild animals for his subsistence. But, when he grows old, heavy, and less fit for the exercise of hunting, he approaches frequented places, and becomes more dangerous to man and the domestic animals. It has, indeed, been remarked, that, when he sees men and animals together, he attacks the latter, and never the former, unless any person strikes him; for, in this case, he is wonderfully alert in distinguishing the man who hurts him; and he instantly quits his prey to take vengeance on the offender. It is alleged, that